
A DYNAMIC APPROACH TO SERVICE PROVIDER BOUNDARIES:

The Case of the Logistics Industry

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Doctor of Philosophy



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ABSTRACT OF THE RESEARCH

The role of a systems integrator has emerged associated with large-scale, often project-based industries. This research addresses the development of systems integration in service provision by investigating service provision boundaries. The main purpose of the study is to contribute to the ongoing debate about systems integration through an investigation that goes beyond a binary perspective of insourcing and outsourcing. Grounded in the theoretical assumptions from the resource-based view (RBV), transaction cost economics (TCE) and agency theory (AT), the thesis aims to explain the development of systems integration capabilities in service provision, using the provision of logistics services as a context.

Theoretically, this thesis demonstrates how conventional economic and sociological theories (and in particular a multi-theoretical perspective) contribute to understanding service boundary decisions for provider firms, focusing on *ex-ante* and *ex-post* contractual and relational governance mechanisms.

Methodologically, the study adopts an abductive research approach using a multiple case study design and interviews as a means of qualitative data collection. The case study both tests established theories and develops new propositions in the fields of operations and supply chain management. This approach of using qualitative data to deductively test and support theoretical constructs is an emergent methodology in operations management research.

The managerial implications of this study contribute to better understanding the nature and role of systems integrators and illustrate how this phenomenon can be applied to service providers in a logistics context. The findings and the proposed service provision continuum can therefore enable provider firms to enhance their management of their service offerings and outsourcing arrangements.

The primary contribution of this thesis is an empirically derived and contextualised framework that offers firstly a new approach to a service provision continuum and secondly proposes four dynamic archetypes of service provision.

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LIST OF ABBREVIATIONS

3PL	Third-Party Logistics
4PL	Fourth-Party Logistics
AT	Agency Theory
CEP	Courier, Express and Parcel Services
CoPS	Complex Products and Systems
EPoS	Electronic Point of Sales
ERBV	Extended Resource-Based View
ERP	Enterprise Resource Planning
FTL	Full Truckload
FMCG	Fast Moving Consumer Goods
HGV	Heavy Goods Vehicle
IMP	Industrial Marketing and Purchasing
LSC	Logistics Service Carrier
LSP	Logistics Service Provider
LSP (out)	Outsourcing Logistics Service Provider
LSP (inst)	Institutional Logistics Service Provider
LSI	Logistics Service Integrator
LTL	Less than Truckload
NPD	New Product Development
OEM	Original Equipment Manufacturer
PAT	Principal Agent Theory
PSS	Products, Service and Systems
R&D	Research and Development
RBV	Resource-Based View
SCA	Sustained Competitive Advantage
SCM	Supply Chain Management
SI	Systems Integration
SLR	Systematic Literature Review
TCE	Transaction Cost Economics

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ADDENDUM PAPER TO THE PHD

Purpose: The research demonstrates how service firms use their individual capabilities and offerings to re-position themselves in a highly competitive and fragmented market. The study sets out to empirically investigate how the dynamics of the boundaries between service providers firms differ in competitive markets, using logistics services as a context.

Theory and concept: This research uses RBV theory to explicate the positioning and competitive success of service providers in the market and to develop a contextual framework that illustrates four archetypes of service provision. TCE logic is applied to explain and understand how certain service providers re-position within the market.

Design and methods: The research is exploratory, using qualitative data. Data were collected in the form of 30 semi-structured interviews with various provider firms at management and CEO-level. The interview guide was based on theoretical constructs regarding physical and intangible capabilities (following RBV theory to understand the specific firms' positioning) as well as constructs related to governance and transactional operations (following TCE logic to understand service dynamics across boundaries).

Findings: The findings show that commoditized service providers, despite their weak competitive position, make numerous, and sometimes strategic, attempts to overcome the industry-specific barriers that are given in a competitive service market. The data suggests that these boundary crossing attempts, however, rarely lead to directly breaking through boundaries to position themselves in a more profitable market position. A switch within archetypes from highly commoditized (logistics carriers) to a higher margin integrated position is only possible if the relationships and network capabilities are leveraged, regardless of the assets and physical resources employed. Counter intuitively, the data also suggests that the most complex service provision (integrator firms) mostly gain knowledge and maintain their sustained competitiveness by accessing and incorporating lower-level, more asset-based, service offerings. This leads to the conclusion that the most integrated service providers do not solely rely on their advanced, or more integrated, position per-se but have to collaborate with sub-tier provider firms.

Relevance and contribution: The study challenges conventional, static definitions of service boundaries largely based on outsourcing studies. In addition the study proposes a contextualised model that constitutes four archetypes of service provision in logistics markets and highlights the dynamics between service boundaries. The study also empirically challenges accepted definitions of service integrators (4PL services in logistics) arguing that assets and physical resources actually do play a major role in offering highly integrated service solutions. Finally the research uses TCE logic in a service context to explain why providers of commoditized services cannot escape from low-margin and highly competitive market positions simply by acquiring assets.

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1 Introduction

This study empirically explores service provider firms attempts to reposition their service offerings across service provision boundaries. For the research design a context was required where there are clear demarcations between levels of service provision. Logistics service providers were chosen as a market where there distinct demarcations between levels of service provision that are recognised by industry professionals. Basic logistics service providers' bargaining power is reduced to a minimum (Hertz and Alfredsson 2003, Chu and Wang 2012) due to the low entry-level requirements and the standardisation of logistics processes. Third-party logistics (3PL) firms offer considerably more services and critically are differentiated by offering forms of integration. However 3PL's compete for the same customers (Wu et al. 2009, Mantin et al. 2014) and they are even forced to serve multiple customers at the same time (Shi et al. 2016). The third distinct logistics service provider category is that of a systems integrator role – so called fourth-party (4PL) providers (Win 2008, Huemer 2012).

Drawing on the growth of outsourcing practices from the 1980s and 1990s, various academics have attempted to categorise and classify logistics services from third parties (Lieb 1992, Berglund et al. 1999, Skjoett-Larsen 2000, Bask 2001, Marasco 2008). Interestingly, these extant definitions of logistics services and respective provider roles offer essentially static and discrete positions for services – i.e. service providers adopt a competitive offering and stay with it. Recent practitioner and industry studies (Kille and Schwemmer 2015, Langley and Capgemini 2015) have suggested that market conditions are changing rapidly and therefore the older and rather static service boundary positions between different provider firms may no longer be accurate, as the range and variety of services increases (Kayakutlu and Buyukozkan 2011).

Therefore, examining boundaries between service providers as potentially dynamic, potentially overlapping (as well as potentially static) positions will be a contribution of this study; by creating a framework that helps both academics and practitioners evaluate the opportunities available for service provider firms. The research design is to study logistics service providers based in Germany and that operate within Europe. The European logistics service providers market offers unique and challenging characteristics in terms of competition and density mainly driven by Eastern European liberalization in the 1980s. This European market has experienced constantly increasing demand mandating efficient systems in logistics (Fabbe-Costes et al. 2008, Cui and Hertz 2011). For instance, multi-layered manufacturing structures as well as the machine-engineering industries in Germany ask for individual shipments that range from stackable, packaged to bulky and heavy goods (Kille and Schwemmer 2015). But it is not only the nature of shipments that draws increasing attention to service providers. The service offerings themselves have developed from standardised and commoditized transportation of full-truck-loads (FTL) to just-in-time deliveries and complex in-house logistics operations within production or assembly plants (Kille and Schwemmer 2015). Also, since the liberalisation of the European logistics market in the 1980s (Cieslik and Michalek 2015) mainly Eastern European carrier and logistics firms transformed the industry into a highly

competitive and low-margin market. Until then, the logistics and transportation market was protected by licences and concessions. The deregulation of tariff-rate quotas for transportation services, for instance, lead to an ultimate drop in mileage and shipping prices. Market entry barriers were basically eliminated and today, only small investments are necessary to set up and run logistics service operations within the European mainland. As a result, the industry fragmented but also some logistics groups merged in order to offer more integrated services and industry specific operations. This trend of modifying and adjusting services in terms of scale and scope, challenges traditional service providers with their emphasis on undifferentiated (un-adapted) transportation and warehousing. These mainly small and medium-sized provider firms struggle because they only provide commoditized services. Naturally some of these particularly medium-sized service providers in Germany are tempted to jump boundaries to enter a less competitive, higher margin form of service provision. In light of the issues discussed in this introduction, this study takes as its point of departure the following research question:

How can service provider firms in competitive industries re-position themselves beyond the conventional boundaries of service offerings?

Answering this question will bring a dynamic perspective to currently inherently static definitions of service provision boundaries.

2 Theoretical frame of reference

There has been a trend towards exploring logistics as a sub discipline within the wider management domain of supply chain management (SCM) and outsourcing (Larson and Halldorsson 2004). Within logistics services, research traditionally borrows theories from other disciplines as there is a lack of theoretical explanations of logistics phenomena (Stock 1997, Arlbjorn and Halldorsson 2002, Bolumole et al. 2007). Since the explanation of the growth of logistics can be rooted in the division of labour, there is a relationship between outsourcing itself and the understanding of logistics services. Stemming from outsourcing, the most prominent approach is transaction cost economics (TCE) that is used to describe contractual and relational governance issues between buyers and suppliers (Williamson 1985, Greenberg et al. 2008). This logic, however, is usually applied to the strategic decisions of making or buying products from a manufacturing perspective (Leiblein 2003, Gilley and Rasheed 2000/2006). This research takes a new approach by looking at the service provider side of outsourcing by presuming that in a service context, provider firms also differ in their relational and contractual governance. Following TCE logic implies the governance of service provision will be organised either as a market, or hybrid or hierarchy which suggests alignment with this study's interest in service boundary dynamics. In addition, by investigating the provider side of service outsourcing, the resource-based view (RBV) of the firm addresses core competencies and the exploitation of assets (Penrose 1959, Wernerfelt 1984, Barney 1991, Teece 1997, Barney 2001). These concepts, which again have mainly been applied to the exploitation of resources in a manufacturing or production environment, can also be applied to services (Poppo and Zenger 1998, Wong and Karia 2010). In summary, this paper uses

RBV logic to evaluate the core capabilities of services and TCE logic to evaluate the dynamics of service boundaries.

2.1 RBV and the competitiveness of service providers

The RBV of the firm as a theoretical lens examines the exploitation of a firm's resources and capabilities as the antecedents for its competitive advantage (Penrose 1959, Wernerfelt 1984, Barney 1991). The central unit of analysis is the firm's strategic capability for exploiting tangible and intangible resources. Hence, assuming the firm is a bundle of resources, organisations are directed to focus on their core competencies (Prahalad and Hamel 1990). Olavarrieta and Ellinger (1997, p.559) point out that there has been "no clear exposition of the [RBV] approach [...] in the logistics literature". Subsequent research has aimed at identifying a unified theory of logistics (Mentzer et al. 2004) and interest in logistics capabilities and competences has become increasingly important (Halldórsson and Skjøtt-Larsen 2004, Halldórsson et al. 2007).

Whilst traditionally applied to manufacturing and production, this study frames RBV related constructs around the provision of services and the development of integrated capabilities. The combination of service provider firms' capabilities, both tangible (i.e. the logistics assets and equipment they own) and intangible (i.e. industry knowledge and know-how) suggests differentiated service providers and service boundaries. Logistics operations may involve capital-intensive asset investments, whereas attempts to foster supply chain wide solutions (i.e. horizontally and vertically integrated) may require a focus on collaborative measures and more intangible assets. RBV can help framing dynamic service provision boundaries at either extreme of a service provision spectrum. RBV logic then will serve as a point of reference for conceptualising the service provision boundaries in this study, as is presented in Figure i.

2.2 TCE and the market transactions of service providers

Rindfleisch and Heide (1997) summarise empirical research across multiple disciplines that discusses the governance problems and mechanisms using TCE logic. They investigated the validity of transaction cost frameworks following Williamson's call for empirical research to extend the focus and refine TCE. Referring to TCE theory, and particularly Oliver Williamson's version of TCE that comes closest to "business decision makers" (Ghoshal and Moran 1996, p.16), transaction associated costs increase when transactions are characterised by high 'asset specificity', high 'uncertainty', 'small numbers bargaining' and high 'frequency'.

The transaction cost approach views 'asset specificity' as the main determinant in conceptualising relationships in terms of choosing the optimal governance form (Williamson 1985). "Asset specificity refers to the level of customisation associated with the transaction" (McIvor 2009, p.47). The specification of assets that can also be referred to as the specific investment in a particular transaction (Williamson 1981) is an important characteristic in TCE, as it describes the value of utilising certain assets outside a transaction. Asset specificity attribute a loss of value when employing an asset in non-

optimal uses, which results in quasi-rents (Williamson 1991, Vandaele et al. 2007). This quasi-rent approach assumes that the value of an asset or factor is higher in its best use than the value in its second-best use. Generally speaking, the higher the asset-specific investments, i.e. best use, the lower the value outside the transaction, i.e. second-best use, and vice versa. Every exchange in a market requires these kinds of transaction specific investments in order to gain quasi-rents (Klein et al. 1978), which occur in the form of physical customisation, human assets, such as specialised knowledge or site specificity in terms of location. Empirical studies have tested the effect of asset specific investments on outsourcing or make-or-buy strategies. While two exemplary studies support the positive correlation between asset specificity and knowledge on the choice of governance form (Dutta et al. 1995, Lee and Lim 2001), other studies deny a positive effect of asset specificity on outsourcing decisions (McNaughton 2002, Parmigiani 2007).

2.3 The context of logistics services as a core competence of firms

Until the 1970s, logistics operations were mainly conducted and organised in-house with a focus on storing and transporting finished products (Sheffi 1990, Bowersox et al. 2012). These activities then became more and more relevant for management attention as potential of cost savings was recognised in the production and manufacturing industries. This trend of taking logistics management more seriously – is grounded in the outsourcing movement beginning in the early 1980s – which ultimately initiated the development of third party or 3PL providers (Bowersox et al. 2012, Cui and Hertz 2011). The further integration of logistics activities in the 1990s and the linking of different functional areas, such as logistics, marketing and procurement, led to development of enterprise resource planning (ERP) systems that finally allow manufacturers and producers to outsource the entire logistics function (Fabbe-Costes et al. 2008, Cui and Hertz 2011, Huemer 2012). Today, all operational and managerial processes and logistics activities can be outsourced to 3PL providers, which operate on behalf of their clients. The core competencies, however, are mostly limited to the actual logistics operations, such as transportation and warehousing, as well as organising the relevant carriers and freight forwarders (Mortensen and Lemoine 2008). The responsibilities and capabilities that these 3PL firms provide in today's business environments are multifaceted and range from traditional 'arm's-length'¹ sourcing, such as organising and buying transportation and warehouse services, to managing more complex logistics processes (Yeung et al. 2012). 3PL providers can be divided into two main categories, 'those who own transportation assets and those who do not' (Sheffi 1990, p.34). This distinction becomes more relevant in the later conceptualisation of different archetypes of service provision in this study. Marasco (2008) points out that despite the growing literature on these providers, there is no clear definition of what third-party logistics includes and encompasses. She summarises different functions and introduces boundaries of 3PL services, which range from traditional transportation and warehousing activities (Laarhoven et al. 2000), managing

¹ The term 'arm's-length' describes a type of relationship in the context of logistics services characterised by the exploitation of economies of scale due to consolidation of transportation and warehousing volumes.

the entire or selected logistics processes or activities (Coyle et al. 2003, Lieb and Bentz 2005), to the provision of management support by maintaining a close outsourcing relationship (Berglund et al. 1999). These variations of service offerings are illustrated in Figure i in the form of overlapping service boundaries that are standardised outsourcing activities, highly integrated relationships, and the continuous adaptation of systems.

Logistics literature and research today still lacks theoretically informed work and mainly consists of practitioner-based studies. Marasco (2008) asserts that “further development of the field requires greater emphasis on the development of theory, constructs and conceptual frameworks in order to build a conceptual foundation” (p.142). The scope and specific functions of 3PL providers represent an amorphous and fuzzy area of business operations. Consequently, an initial conceptual framework has been derived that will later be contextualised to demonstrate the dynamics between service archetypes. The presented *ex-ante* theoretical model (Figure i) relates to the relevant RBV assumptions of focusing on core business units as well as TCE logic that mostly refers to the frequency and asset specificity of services in the market, resulting in little transaction costs of standardised market dyads and high transaction costs for hierarchical structures and customized services.

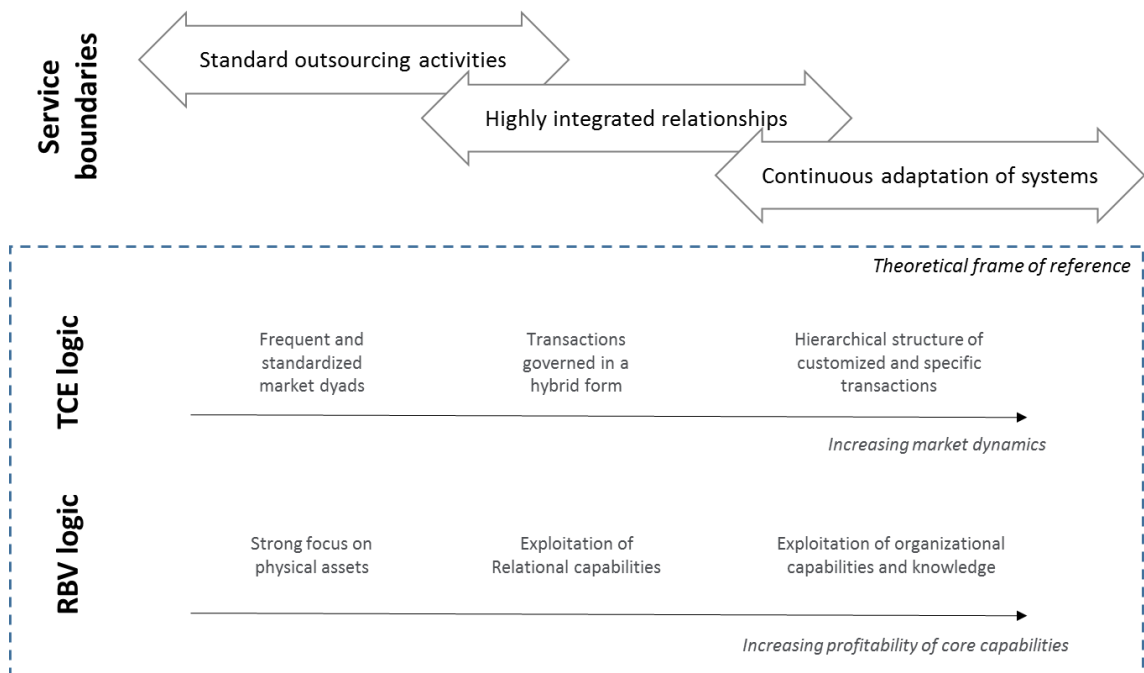


Figure i: *Ex-ante* theoretical model

3 Research method

The exploratory nature of this study calls for a purposively selected sample group (Dubois and Araujo 2004) with in-depth knowledge, which allows the researcher to gain rich information (Kavale 1983) into the phenomenon of service provision. In order to guarantee critical insights into behaviours, semi-structured interviews were conducted at management and CEO-level. For exploratory research, interviews as a means of data collection are the single most important source of evidence (Eisenhardt and Graebner

2007, Yin 2014), particularly in operations management research (Walker 1985, Denis et al. 2001, Bingham and Davis 2012). A mix of open-ended and conceptual questions allowed the researcher to thoroughly explore the topic of interest. All questions were asked in a sequential and consistent order, however, the interviews also stimulated additional avenues of interest, as was more or less expected (Berg et al. 2004). Hence, the discussion and interview process allowed for further areas of interest to be raised and explored that were not initially considered in the conceptual framework, which also necessitated the researcher to go ‘off-script’ (Brewerton and Millward 2001). This process, however, still required the interviewer to make certain judgement calls about the direction of the interview (Patton 2002), in order to remain focused on the overall research aims and objectives. In sum, all interviews adhered to a comprehensive interview guide (see Appendix), but allowed for clarifying as well as open-ended questions and more general discussion towards the end of the interview. In total, 30 interviews that lasted between 40 and 90 minutes were conducted over a period of ten months. Appendix C represents the detailed record of fieldwork undertaken for this study. The use of a tape recorder was employed in most cases, insofar as it has been said to reduce researcher bias (Voss et al. 2002). Notably, three of the interviewees did not agree to be recorded, due to confidentiality issues.

ID	Role	Description of key responsibilities
3	CEO	The CEO of a family-owned logistics carrier firm is mainly concerned about keeping long-term customers that stabilize the firms’ turnovers.
6	Head of Network Development	The management level responsibilities of interviewee 6 include the coordination and organisation of strategic collaborations with other logistics partners within central Europe in order to achieve larger scale and scope of the service organisations’ logistics offerings.
7	Key Account Manager	The key account manager for automotive customers develops and communicates integrated and specialised logistics solutions with a focus on just in time and express deliveries, the key objective is maintaining and extending customer loyalty.
15	CEO	The CEO of a provider for bulk cargo and paper products represents the interface between the administrative and operative logistics services offered to a single customer.
14	Account Coordinator	The business developer for a large technology-oriented service firm coordinates the communication and implementation of integrated and technology-driven business solutions that currently help customers in the retail and high-tech industry to increase supply chain visibility. The scale and scope of service offerings is nearly unlimited and can be customised to any industry.

Table a: Description of interviewees (excerpt)

The data analysis process was conducted iteratively and included the collection and analysis of data by constantly transforming fieldwork into notes and comparing those notes to theory and extant literature. Coding schemes (Miles and Hubermann 1994) were developed throughout the data collection process, helping to critically fill in gaps or ambiguous findings and address any unanswered research questions. The processes, therefore, should not be seen as separate but as one iterative phase, where data collection and data analysis interconnect and overlap. The four iterative phases included (1)

transcribing field notes, (2) coding and preparing qualitative data, (3) summarising and displaying findings and (4) drawing conclusions from analysis as it adheres to the initial conceptual framework. In summary, the research strategy started with a theory-driven development of an *ex-ante* theoretical framework (Figure i). After collecting and analysing data, first conclusions in the form of service provider archetypes (see the conceptual model Figure ii) were drawn. Finally, a contextualised framework (Figure iii) illustrates the empirically derived findings within the logistics market.

4 Data analysis

The interviewees consistently articulated the ways provider firms position themselves in the market enabling the development of service archetypes, there was less consistency or agreement on how providers can challenge service boundaries.

4.1 Developing a narrative of service provision boundaries

The analysis of empirical interview data is aligned to the *ex-ante* model and starts by exploring the core business of firms (RBV) stretching from a purely asset-based offering to a relational and knowledge-based offering. Analysis also explored the transactional specifications and dynamics (TCE) in the market.

4.1.1 Standardized logistics activities: “There is a large number of firms in Germany right now”

The primary focus of most carrier firms within Germany - the most asset-driven market within Europe - is to fully utilize logistics assets and equipment. For instance, most carrier firms own trucks or delivery vehicles (in the interviews ranging from under ten to about 100) as well as several warehousing facilities. However, in the logistics industry this utilization focus leads to the development of a heavily commoditized market where service firms mainly use their own assets. “*We make an effort to conduct most of our business with our own equipment. However, for bigger projects, such as a two-day transportation, we hire additional subcontractors. But we conduct 75% to 80% of the transports with our vehicle fleet*” (Interviewee 11). Hence, these provider firms find themselves in a position, where they are not able to fully exploit more relational capabilities in order to strengthen and foster close and long-term customer relationships. Transaction cost logic supports this interpretation that highly standardised operations using low level technology and equipment is easy to duplicate and therefore, the logistics firms’ customers can switch between competitors without expecting high costs.

There was a consensus among the interviewees that service firms in such commoditized markets are solely focused on organising their internal operations, i.e. increasing economies of scale. Interviewee 10 points out that “*our sales department is very innovative in terms of consolidating shipments from different customers. For example, we transport steel components on top of flowers*”.

Also, commodification of the service offering means little bargaining power for the carrier as contractor and the strong emphasis on physical resources for standard activities becomes evident amongst most of the interviewees. *“Just recently, I talked to other logistics firms at an event, and generally, the perception amongst all of them is to ideally have an updated and rather new vehicle fleet”* (Interviewee 3). Focused relentlessly on utilization even management and CEO-level executives work on operational activities such as transportation planning. For example Interviewee 3 reported that their CEO occasionally drives a truck or unloads trailers in the warehouse when staff resources are tight. But solutions do not lie in adding more of the same types of physical resources: *“We are building a new warehouse this year [...] because we want to reduce our vehicle fleet by another 20 trucks”* (Interviewee 29). Yet the same interviewee reported that additionally the organization would be extending their existing warehousing space; still focusing on physical assets rather than more relational and collaborative assets. *“We typically do not have a contractual relationship [...] and it is mainly based on trust [...] and we experience that if you do a good job you can rely on your partners [...] and expect the same [orders] every day”* (Interviewee 3).

4.1.2 Larger scale and scope of services: “We can use the truck for something else, which means the planning becomes more adaptable”

In line with TCE logic, service providers that target more customized and specialised solutions benefit from higher bargaining power and can better exploit their specific assets. The interviewees confirm that provider firms have established transportation networks, for instance, that are highly asset-specific including both own as well as collaborative facilities and vehicles. *“[Our firm] has access to ... well, there are different models. We either use our partner’s own vehicle fleet or we expand through additional subcontractors. Some partners exclusively use subcontractors. That means they do not have a single vehicle. [...] In addition, [our firm] possess a pool of trailers, consisting of several thousand swap trailers which are used to deliver cargo within Germany every day”* (Interviewee 12). It becomes apparent, however, that the focus of operations still lies on conventional and commoditized activities such as transportation and warehousing. *“We exploit our contractors’ capabilities and assets, such as vehicles and trailers, especially for regional deliveries to the final customers”* (Interviewee 6). However, relational capabilities allow service providers to collaborate with other partners. *“In various international countries, such as South America or China and also in Eastern Europe, especially in Russia, we collaborate with selected partners over many years”* (Interviewee 23).

What came through in the interviews was that these more advanced types of provider usually developed from the lower level service carriers discussed above. Therefore crossing that service boundary is achievable. Interviewee 7 states that their firm history started as a small transportation carrier for local cheese manufacturers. *“[W]e started with a vehicle fleet of two or three cars, and today we have our own fleet of almost 100 vehicles [...], including normal transporters and 7 ½ ton trucks [...], 7 ½ ton trucks with hangers [...], but [we] also conduct conventional car deliveries, such as packages”* (Interviewee

7). The interview data evidences that the core focus of service provision over time switches from pure asset-based to more relational-based services. Interviewees 6, 7 and 23, for instance, stress that their day-to-day activities involve maintaining close customer relationships in the form of communicating and aligning service offerings to customer requirements. *“It is our responsibility, as a service provider, to accept all of our customers’ requests and orders, and afterwards we look for solutions”* (Interviewee 23).

In a logistics service context, this means that relational capabilities can be transformed to larger scale distribution and transportation networks that will result in understanding the customers’ specific needs. *“We are interested in identifying where the information flow starts. Does it start with the producers or at the end of the production line? [...] At the moment, it [the information flow] is not continuous; it is interrupted at several points, [since] several providers are in charge”* (Interviewee 6). Interviewee 6 gives a representative example of how in services the inter-organisational relationships are evident today and still need to be improved on in the future. Such importance of close collaborations, however, also represents challenges within larger scale service networks. A representative example was highlighted by interviewee 29, who very closely collaborated with a large-scale European service provider operating hundreds of carrier units and vehicles every day. Their partner firm *“went out of business within 3 months and there was no prior sign for a stumbling business”*. This case was even in the news and attracted the attention of the whole market. All in all, interviewees conclude that there is a need to further integrate both horizontally as well as vertically in order to truly become a market leader within the logistics industry.

4.1.3 Customized and specified services: “We do not have many direct competitors because we are operating in a niche market”

In line with the development of the 3PL industry in Europe during the 1980s and 1990s, service firms have further refined their capabilities and started to specialise in niche markets. *“Due to the corporate structure [sic] [hierarchical structure], our annual profit represents the annual cost savings for him [sic] [our customer]”* (Interviewee 15). Such providers are basically institutionalised into a focal firm’s hierarchical structure and therefore offer individuated services to a single customer across manufacturing, production, retail and consumer goods industries. *“Our most important asset is the equipment [...] because it is specific to the products. [...] We cannot use it for shipments or material [handling] of any other company”* (Interviewee 4). Provider firms are not limited to offering their services to any particular industry anymore, but can focus their operations on niche markets. Service provision, even though it is still commoditized, can be highly integrated into the customer’s supply chain and operational processes, following a hierarchical governance structure. Here, provider firms are solely responsible for coordinating and managing the internal and external logistics and sourcing activities. *“We are governed as an internal logistics firm [...] that operates and handles about 80 per cent of the [customer’s] total volume per year”* (Interviewee 15).

The existence of specialised and dedicated provider firms that organise and manage the entire logistics function for a single customer represents the boundaries of a more

integrated but still standardised service firms. *“We cover the sourcing function [...], which includes ... for example, we look at the Asian market for similar or benchmark products, and if we like one [and] we decide our customer needs that as well, we approach the suppliers directly and negotiate the price with them. Afterwards we approach our logistics department and undertake the steps for importing the products”* (Interviewee 5). In this service provider context, the range of services offered is more than in standardised providers but more critically includes close supplier and customer interaction.

4.1.4 A higher form of adaptive service solutions: “Our customers know that we can offer them all solutions along the supply chain”

Given the trend towards internationalisation and emphasis placed on global sourcing strategies, logistics operations have become increasingly complex and responsive *“We offer a complete solution [...] from the internet portal to the logistics functions [...], including financing and payment schemes”* (Interviewee 13). Correspondingly, global supply chains, networks and systems have ultimately led to the emergence of systems sellers and systems integrators. Interviewee 13 also stresses that *“we don’t have our own assets or distribution networks. We subcontract everything to external service providers”*. Such integrator firms are responsible for integrating and coordinating supply chain wide operations that span beyond conventional transportation, distribution and order management services, to also include managing the supplier and customer interactions. *“We developed a lot of know-how in integrating different systems into one system [...] and it requires a lot of know-how to run these systems without errors”* (Interviewee 14).

Whilst generally the interviewees confirmed that the logistics industry is highly competitive, however, long established provider firms do constantly find new ways of positioning themselves within the market; by aligning their service offerings to the current customer requirements. In a way, integrator firms know what their customers need and therefore increases the provider firm’s bargaining power. *“We guarantee customer retention by being the only firm that can offer integrated solutions”* (interviewee 14). Given that our understanding of system integrators borders on the abstract and speculative, integrator firms, as they refer to themselves in the interviews, facilitate the continuous adaptation of systems, this is the service provision boundary that offers more attractive profit margins and competition is lower. *“We operate in a market where there are not thousands of [...] competitors, as it is the case for conventional transportation services. [...] We are more specialized [and our services] are associated with high investment [costs].”* (Interviewee 14). With regard to the ownership of assets, integrator firms place little emphasis on a strict distinction between market and hybrid governance. Instead, the delegation of agency and the capabilities related to customer interaction attract most consideration. *“We are entirely responsible [...] for our customers’ operations [...] and the carriers and suppliers communicate with us directly. [...] We operate in the name of our customers”* (Interviewee 14).

Some participants point out that they aim to achieve supply chain wide solutions but are highly dependent on the their relational capabilities in order to offer also commoditized

service activities, that are of a more operational nature. Paradoxically then, operational tasks, are still a crucial asset of even integrator firms, for example interviewee 9 who refers to his organization as integrators. “*We undertake both procurement [...] and distribution logistics [...] starting from the production of the product, [...] delivery of the [raw materials], [...] consolidate and tailor the products [...] and the final distribution to the retail stores*” (Interviewee 9). Theoretically, integrators should implement a strict hierarchical structure within and across multiple supply chains simultaneously that would allow them to coordinate efficiently (and delegate agency). In practice, however, this hierarchical structure is nearly impossible to achieve, given that the most responsive and integrated levels of service provision involve an inordinate amount of operational tasks and therefore the integrator acts as an agent themselves.

4.2 Presentation of service provider archetypes

The above narrative of the empirical interview data ultimately results in the proposition of the following four service archetypes that are further illustrated in the conceptual model (Figure ii). The proposition of the four archetypes is aligned to the *ex-ante* model (Figure 1) and focuses on the service boundaries within the logistics market in Germany:

1. **Logistics service carriers (LSC):** Provider firms possess privately owned assets in order to conduct standardised logistics services. There is no or little market integration (in the form of vertical integration) or interaction with end-consumers. Boundaries are typically represented by asset-based core functions.
2. **Outsourcing logistic service providers (LSP out):** Service providers partly own physical assets or logistics equipment but firms can rely and exploit their relational capabilities in order to maintain a national or even European-wide logistics networks. These provider firms focus on a continuous communication with multiple upstream suppliers and manufacturers even though they have limited interactions with downstream customers or end-consumers. Hence, their service offerings are on a large scale but smaller in scope.
3. **Institutional logistics service providers (LSP inst):** Assets are partly owned by the provider firms but primarily shared with one major customer; the provider firms manage and organise all information flows between the single customer and its sub-tier suppliers (upstream) and sometimes even to downstream end-consumers.
4. **Logistics service integrators (LSI):** Physical assets at the most support the facilitation of integrated solutions; LSI firms place emphasis on the continuous adaptation with (downstream) customers and/or end-consumers; they primarily rely on their organisational capabilities and they delegate agency across the supply chain with multiple customers in a hierarchical governance form.

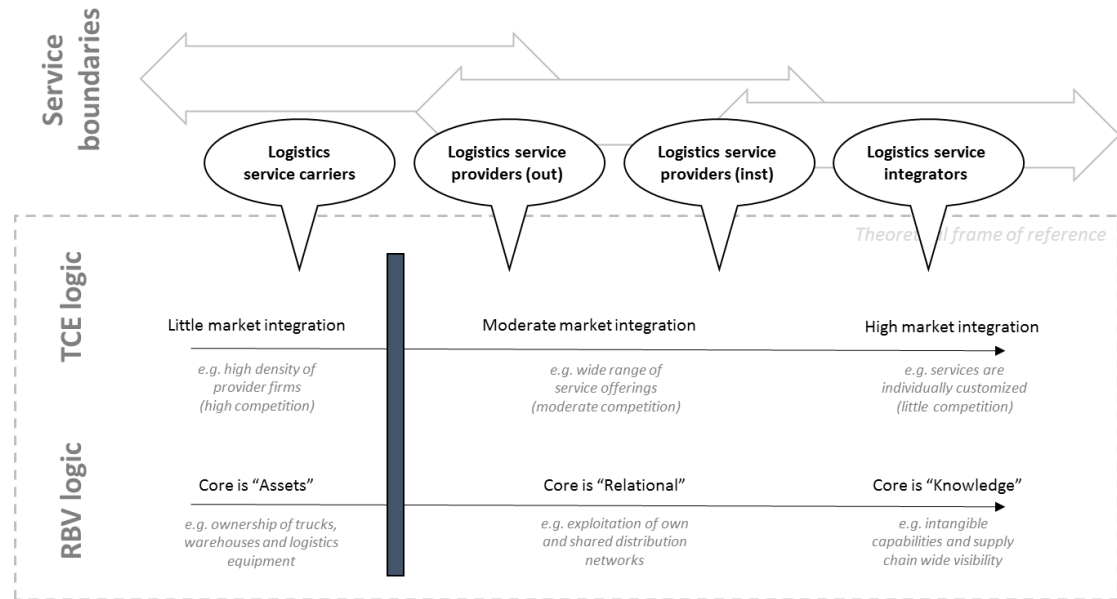


Figure ii: Conceptual model of service archetypes

Going back to the original problem statement of a highly competitive and fragmented service market, the interviews confirmed that TCE logic holds true regarding the very high competition for commoditized activities within un-integrated markets. Vice versa, the more integrated and interactive transactions are (i.e. increasing transaction costs), the less the number of competitors and the higher potential margins are. However, and as the later discussion will elaborate, crossing the boundary to provide highly integrated services is hard to accomplish. The conceptual model (Figure ii) illustrates these polar opposites of the proposed archetypes as LSC services on the very left and LSI services on the very right. Regarding market integration, a solid barrier in the diagram represents the competitive trap that LSC firms try to escape in order to fully exploit market and integration potentials. In addition, the horizontal arrows to the right (towards LSI services) show how dynamics evolve in terms of market integration and exploitation of capabilities. Hence, the conceptual model underlines that there is no binary distinction once the market barrier has been overcome resulting in a grey and dynamic area of integrated and transaction-intensive services.

The RBV logic of exploiting assets and focusing on core business operations could also be confirmed as this is illustrated in the bottom part of the conceptual model. Data shows that owning and exploiting resources is not enough to gain competitive success, it is rather the development of relational and organisational capabilities that lead to increasing options for commercial success. Firms that are operating beyond the boundaries of competitive services (i.e. beyond the solid industry-specific barrier) do not focus on physical assets. Therefore, in the conceptual model, the nature of the core capabilities has been used to explain the positioning – from an individual firm's perspective – of service archetypes. Building on that positioning, the interviews demonstrated firstly that acquiring physical assets might increase competitiveness amongst LSC firms but does not contribute to developing integrated and profitable service offerings. Secondly, LSP (out) and LSP (inst) firms then mostly rely on their relational capabilities and avoid acquiring

asset-based services. Finally, LSI firms that attempt to maintain and increase their intangible resources such as knowledge and industry know-how achieve the pre-conditions of offering the highest form of integrated and supply chain wide service solutions. Even though the conceptual model demonstrates the dynamic evolution and from two polar aides with a unidirectional arrow, the data suggests that boundary crossing is not just a linear process but includes switching back and forth between relational and knowledge as well as customized and adaptive services. Hence, it is evident that the binary distinctions of services are not represented in the market but rather form a dynamic and fluent service evolution.

Before further discussing these dynamics, the following conclusions can be drawn from the analysis of the interviews, as they were summarised in Table b, including the challenges that service provider firms face in particularly competitive markets.

Service archetypes	Scale	Scope	Profitability drivers and business focus	Assets and capabilities	Boundary challenges
Service Carriers	Domestic or local customers	Basic transactions such as transportation and warehousing operations	Very little profit margins due to high percentage share of labour and variable costs	Physical assets, mostly commoditized and sometimes uniquely customized	Industry-driven fragmentation of the market lowers the competitive success
Service Provider (out)	Large customer base on a domestic and European level	Multiple logistics solutions ranging from simple warehousing and distribution to integrated network planning	Economies of scale reduce the costs per service; however, individual profit margins are still little and competitive	Advanced network capabilities through standardised organisational and relational structures (e.g. horizontal collaboration)	Well-developed network structures hinder individual and customized service solutions
Service Provider (inst)	One single domestic customer	Basic logistics activities across all supply chain levels starting from supplier pick up to consumer delivery	Fully customized solutions increase the bargaining power and therefore justify higher prices; however, no economies of scale possible	Strong relational capabilities and industry knowledge; uses clients' equipment	Small customer base limits the service offerings and competitive success
Service Integrator	Multiple global and multi-national customers	Supply chain wide operations integrated and enhanced through technological	High degree of scalability of developed solutions leads to highly profitable business units	Global reach and integrated network capabilities through integrated IT systems and capabilities	Multi-national and cross-industry service supply chain solutions are holistic but vague in terms of core assets

Table b: Characteristics of service archetypes

5 Discussing a dynamic approach of service provider boundaries

The empirical evaluation of the interviewees' responses and the investigation of service boundaries resulted in the development of the above-mentioned four archetypes of service provision. This study, as it relates to the context of logistics services, summarises the key findings as illustrated in a model representing a dynamic approach of service boundaries (Figure iii). Two axes in the diagram relate in one direction to the core capabilities within a service market ranging from asset-based to relational-based to knowledge-based and in the other direction to the level of integration ranging from standardized to integrated to adaptive services. The model focuses on the most polar extremes of LSC services (bottom left) and LSI services (top right). However, and that is how the model differs from

conventional classification and categorization of services, there is no distinction between service providers. In short, even though there are the proposed archetypes of service provision, this classification only relates to the service boundaries. Figure iii represents therefore highlights the outlier findings as these were the most interesting ones, and opposed to putting provider firms into ‘boxes’ the model stresses these dynamic and polar opposites of service archetypes.

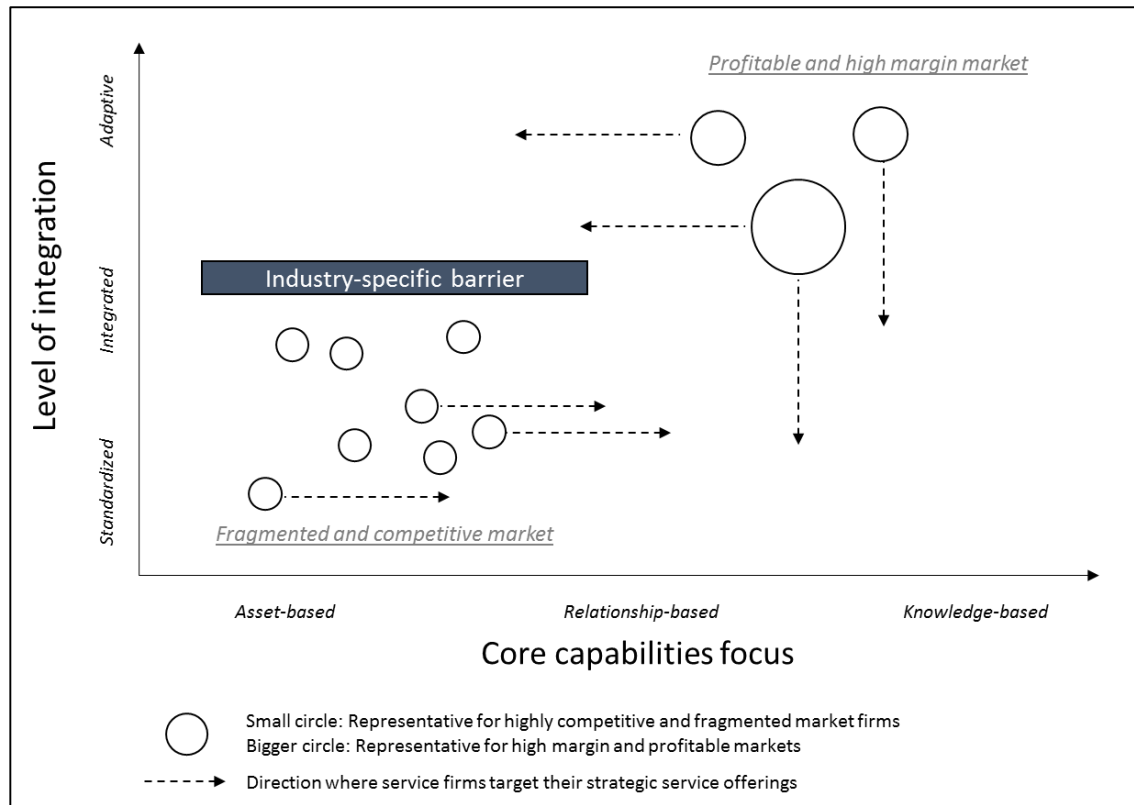


Figure iii: Dynamic approach of service provider boundaries

First, there is no value in making binary distinctions between different types of service providers based on certain pre-defined characteristics. Such characteristics usually (as it is common in the logistics literature) relate to either asset size or revenue that maybe in flux or evolving over time. This paper rather highlights the presence of boundaries that relate to the classification of service archetypes. Provider firms therefore expand on their capabilities within and across these boundaries, which represents a more dynamic model.

Second, and relating to the common definitions of integrator firms and the fabled 4PL providers (that are not supposed to own any assets), these service boundaries are necessary to classify these service offerings within the highest archetype. In addition, the model highlights that in particular the LSI archetype is characterised by boundary crossings back and forth in in order to access and exploit capabilities and knowledge from other archetypes. So data evidences even the highest form of integration strongly relies on physical and tangible assets and resources, interviewees confirmed that in order to establish supply chain wide transparency and visibility over time, it is necessary to access, for instance, the lower level service providers' physical distribution and transportation networks. Hence, the empirical findings do not necessarily support the existence of a pure

and abstract integrator role; from extant literature one would anticipate that integrator firms eliminate all ties to owning physical assets and resources. However, the data demonstrates that offering such integrated services can only be accomplished by switching back and forth between physical assets (e.g. network structures) and supply chain wide coordination (e.g. online platforms). Such switching takes place on a daily basis, when service firms for instance take charge of coordinating their sub-tier carriers' asset and equipment network into the final customers' ERP system. This coordination ultimately results in offering integrated solutions that are based on physical resources.

Thirdly, the dilemma of low-level carrier firms that find themselves in a 'trapped' market position shows that there are strong dynamics between the proposed boundaries. Pragmatically speaking, these low-level carrier firms frequently aim to extend their service offerings by acquiring assets (e.g. warehouses or a vehicle fleet). However, and that is what has been evident amongst the interviewees, operational transactions on such low-level services remain very labour and capital intensive, which is due to the high degree of asset commoditization. Hence, just acquiring more assets does not guarantee a more profitable market position or relate to competitive success. It is rather the further development of relational and knowledge capabilities that enables firms to move up towards more integrated services and high-margin market segments.

In sum, the model in Figure iii underpins the transitioning across and beyond these boundaries - as is illustrated with dotted arrows. Such boundary crossings in particular take place amongst highly integrated services (top right corner) and commoditized and asset-based services (bottom left corner). For instance, what the dotted arrows from the top right LSI services downwards explain is that the most integrative and adaptive solution providers and supply chain architects actually gain knowledge and capabilities from global or multi-national (commoditized) network players that have acquired large scale logistics businesses over time, such as DHL, FedEx, UPS or Hermes, just to name a few; those that are highly standardized in their operations. Such integrated provision of services or solutions (as they are commonly called in LSI services) therefore cannot exist just on their own and must rely on lower-level and more commoditized capabilities. In fact, this empirically derived contribution mostly contradicts conventional definitions of fourth-party logistics (4PL) providers. These definitions include that 4PL firms only provide knowledge and organisational capabilities without owning or exploiting any assets or physical resources. Interestingly enough, only a few of the interviewees actually claimed to be such a 4PL provider firm by definition, but all of them also confirmed that it is impossible to develop entire and supply chain wide service solutions, even cross-industry, without having very close and frequent interaction with physical resources.

These findings, however, do not hold true for firms in the lowest, most commoditized and asset-based archetype of service provision. In the diagram, the small circles in the bottom-left illustrate the fragmented service industry, where firms cannot easily escape their unprofitable position. Hence, there are certain limitations that are due to the highly fragmented service landscape in Europe, which is illustrated with a solid line labelled 'industry-specific barrier'. However, and what the empirical data evidenced is that in

particular firms that are not necessarily bound to certain customers or clients do actually build on relational capabilities by forming horizontal alliances and partnerships in order to switch service positions, as is illustrated with the dotted unidirectional arrows from the bottom-left to the bottom-right.

6 Conclusions and implications

The study examined the boundaries around service providers in the context of the highly competitive logistics market in Germany, and identified four archetypes of service providers. In addition, the empirical data collected from participating senior management and CEO-level participants informed that analysis, on how firms within such highly competitive markets can move and re-position themselves. That is for low-level carriers to adjust to more relational and knowledge-based capabilities that could be done by forming alliances and collaborations (horizontally). Also, well-established provider firms that already possess the necessary resources and network structures must frequently engage in knowledge sharing and know-how transformation in the form of accessing more asset-based service lines in order to increase their competitive success over time. Hence, the following implications can be drawn from the research.

6.1 Research implications

Using RBV and TCE theory to explain the dynamics at play at service boundaries positioning, has proven to be the appropriate means of analysing data within the context of logistics services in Germany. Most extant research has used these theories to understand organisational and relational phenomena in manufacturing and production industries. However, this study follows McIvor's (2009) attempt at evaluating service-related outsourcing operations.

In detail, RBV theory has provided standard frameworks to explain competitiveness among firms for many decades. This study has reminded us that services can also be seen as a commodity, in particular the highly asset-based logistics carriers that are 'trapped' within a commoditized service market.

TCE theory, on the other hand, has been used extensively to explain switching governance and inter-organisational behaviour in a make-or-buy context within manufacturing and production. This study applies the theoretical antecedents to the level of integration and asset specificity of resources in order to describe the switching and re-positioning of firms beyond conventional service archetypes.

In sum, the study provides a comprehensive evaluation of service-related application to RBV and TCE theory. However, the theories were not challenged directly but underpinned the argument of exploring boundaries and archetypes within a service domain. The presentation of empirical data, as it followed a theory-led analysis, therefore serves as a starting point for future research as the conceptual model can be further generalised and validated within different industries or markets, as is described below.

6.2 Limitations and future research

A primary tenet in management disciplines pertains to the degree of generalisability of empirical research and the corresponding limitations of a study. This study has addressed a highly competitive service market and its findings may not apply to less competitive service markets. In terms of research design, qualitative research in the form of the selected interview partners and respondents in this study can be seen as imprecise, lacking measurability and validity. To address such concerns an iterative analysis method was adopted that constantly switched between data, analysis and findings.

In order to improve and build upon this study, a future research agenda in the form of a case study approach in combination with a competitor analysis is suggested. This might include the following steps. The unit of analysis should remain service provider firms that represents a wide range of services and have a European wide business scope. By using similar firm types and conducting an in-depth investigation of the firms' service offerings, future research could quantitatively evaluate and compare the case firm within the market, including certain control variables, such as number of assets, revenue, number of employees, frequency of shipments, just to name a few. Finally, the case study analysis should rely on the proposed model in this study and quantify the two dimensions of "level of integration" and "core capabilities focus". By doing so, conclusions can be drawn on *how* provider firms address the proposed service boundaries and *why* they specifically hold certain assets.

6.3 Managerial implications

The empirical data suggests two outcomes and managerial implications. First, on a tactical (and strategic) level, providers of basic services must undoubtedly switch to the acquisition of relational capabilities by going beyond their traditional service boundaries that are, in this study, simple warehousing or transportation. Hence, service carriers can achieve a better return on investments by collaborating with more advanced service providers and learn from their existing business models. This also means in return that such low-level carrier firms must not further invest and develop their current core business units. Such findings, alternatively, can also be related to other service-driven business models, as they appear in maintenance, public services or accommodation, for instance.

Second, developing integrator capabilities (as they relate to technological and process integration along the supply chain) on a large scale requires the very close and constant exchange of knowledge and know-how with lower-level provider firms. Therefore, decision makers must not be reluctant to sometimes invest in accessing and collaborating with smaller and more asset-based services. In return, this means that also these asset-based and more developed provider firms can move up towards the development of integration capabilities with the potential to achieve more commercial success.

CHAPTER ONE: INTRODUCTION

This research explores the role of systems integrators by re-defining the boundaries of service provision within the context of logistics systems. In particular, the conventional approach of classifying service providers into distinct and separate types (Selviaridis and Spring 2007, Cui and Hertz 2011, Rajesh et al. 2011) is challenged and a novel framework is developed that suggests a continuum across four different proposed archetypes of service provision. Furthermore, this thesis aims to stimulate and contribute to the development of research in operations management (OM) about systems integration (Davies et al. 2007, Prencipe 2003, Lewis and Roehrich 2009, Caldwell and Howard 2010, Roehrich and Lewis 2010) superseding a binary discussion of insourcing and outsourcing. The extant literature on outsourcing practices has placed little emphasis on the nature of the actual service providers. Hence, this thesis contributes to the current discussion by tackling the phenomenon of service provision from a multi-theoretical perspective, following a qualitative abductive research approach. The following statement summarises the key points including the scope, approach and contribution of this thesis:

Research Scope: This study concentrates on the discipline base of *outsourcing* in the domain of *operations management*. It *conceptually* adopts a multi-theoretical approach focusing on the constructs of inter-organisational relationships (with a concentration on *service providers* in *logistics systems*) in conjunction with the constructs of *systems integration*. Three theoretical lenses, that is, the *resource-based view* of the firm, *transaction cost economics* and *agency theory*, guide the research.

The remainder of this chapter highlights the justification for this research by outlining the theoretical, methodological and managerial background. Research gaps are identified and scope is defined based on the proposed research objectives and questions that are purposively addressed in this thesis. In addition, basic concepts and definitions are offered

in order to illuminate discussions and conceptualisations in this research. Lastly, the structure of this thesis is outlined.

The development of a service provision continuum, as it is proposed in this thesis, contributes to ongoing discussions in operations management research by contextualising the case study findings within the logistics industry. Extant literature traditionally focuses on the manufacturing side of service provision and little is known about the provider firms' perspective. However, their perspective is important, particularly as providers become more active; this in and of itself is a relevant insight, insofar as these providers have traditionally been presented as being rather passive in the literature. Hence, the primary unit of analysis in this thesis is the service provider. Accordingly, service provision boundaries are evaluated based on various theoretical constructs (i.e. independent variables) stemming from RBV, TCE, AT and SI literature. This research is important because it advocates that scholars and practitioners re-consider insourcing and outsourcing decisions, and elucidates the role and nature of systems integrators in the logistics industry from the providers' perspective. It also suggests additional or new insight into the use of case study research in OM.

1.1 Justification for this Research

Starting as a postgraduate research project, this thesis targets the academic field of operations management and aims to contribute to the ongoing discussion about systems integration in the context of the logistics industry. An initial systematic review of the literature identified the theoretical, methodological and managerial gaps in the extant literature, thus the initial contributions are illustrated in the following Figure 1.1.

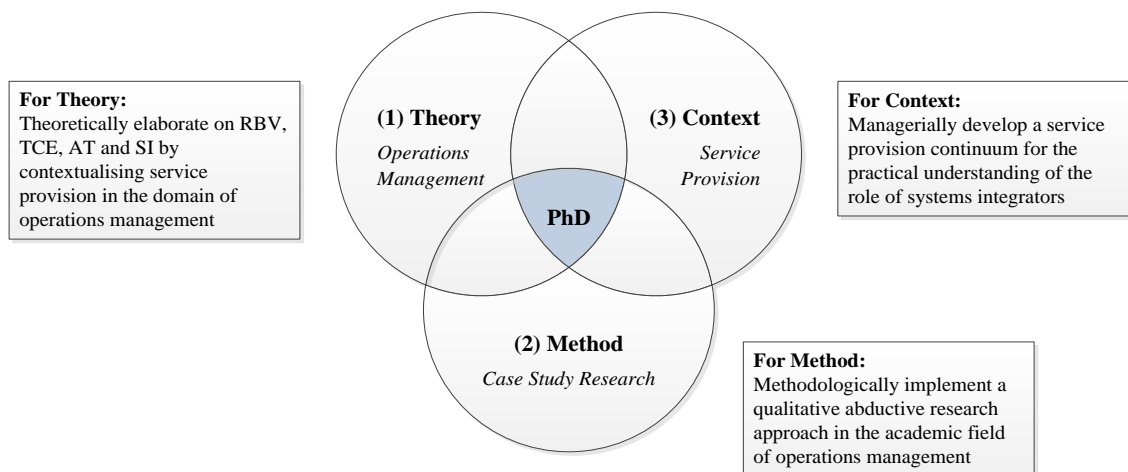


Figure 1.1: Positioning of this PhD Thesis

The following subsections outline the theoretical, methodological and managerial background that justifies this research.

1.1.1 Theoretical Background

Drawing on the extensive number of literature reviews within the academic fields of operations, marketing and supply chain management (Croom et al. 2000, Burgess et al. 2006, Seuring and Müller 2008, Hochrein et al. 2015), most studies have identified that the resource-based view (RBV) of the firm, transaction cost economics (TCE) and agency theory (AT) are the most commonly adopted theoretical lenses used in management research, particularly in the context of purchasing and supply chain management (Spina et al. 2013, Weele and Raaij 2014).

Outsourcing and the provision of services has increasingly received attention amongst management scholars that focus on the growing complexity of industrial buyer-supplier relationships in various industries (Zheng et al. 2008, Caldwell et al. 2009, Lewis and Roehrich 2009, Roehrich and Lewis 2010, Selviaridis and Spring 2010, Caldwell and Howard 2014). Hence, the nature of conventional dyadic relationships is shifting towards managing more complex systems, which is also referred to as products, service and systems (PSS) in the operations management and servitisation literature (Tukker 2004, Baines et al. 2005, Wilkinson et al. 2009). This development of PSS stems from the increasing downstream integration witnessed in manufacturing and large-scale industries (Wise and Baumgartner 1999, Prencipe 2003, Hobday et al. 2005, Davies et al. 2007). While originally couched within the context of manufacturing and industrial marketing management, this trend is also evident in the service industry and in the context of logistics systems (Selviaridis and Spring 2010).

In sum, this thesis considers two research streams: (1) Service outsourcing from a purchasing and supply management perspective and (2) systems integration from an industrial marketing management perspective, in order to present a comprehensive and multi-theoretical framework for the evaluation of service provision in logistics.

1.1.2 Methodological Background

The use of case study research finds increasing application in operations management research in order to both test and build theories (McCutcheon and Meredith 1993, Stuart et al. 2002, Voss et al. 2002, Barratt et al. 2011, Ketokivi and Choi 2014). Following calls

for more field-based research (Lewis 1998), case studies have emerged as “one of the most powerful research methods in operations management” (Voss et al. 2002, p.195). Furthermore, recent case research stems from a qualitative research tradition, distinguishing itself from a quantitative perspective that is typically adopted in operations research (OR) studies (especially in North America). Barratt et al. (2011) justify this methodological shift in highlighting the lack of rigour and in-depth analysis of social phenomena. In response, they suggest researchers adopt more inductive as well as deductive case study approaches, using qualitative data. This relatively new way of approaching operations management research served as the methodological starting point for this thesis, incorporating both an inductive and deductive, namely an abductive research approach. In particular, the rapidly changing environment in OM research requires more rigour and in-depth analysis of certain phenomena (MacCarthy et al. 2013), which can be achieved by applying qualitative research methods.

1.1.3 Managerial Background and Research Context

Referring to the ongoing trends of globalisation and outsourcing, the logistics market has experienced significant growth. Langley and Capgemini (2015) conduct a large-scale annual survey amongst shippers and providers (‘Third-Party Logistics Study’) to examine the current state of logistics outsourcing in the US. They found that the relationship between customers and third-party logistic (3PL) providers have become increasingly advantageous and satisfactory, where 92% of the shippers and 98% of the providers benefit from a successful shipper-provider relationship, resulting in an average reduction of logistics costs, inventory costs and fixed assets of 9% , 5% and 15%, respectively. Furthermore, they found that the frequently claimed ‘IT gap’ between 3PLs’ IT capabilities and customers’ IT requirements narrows every year. Hence, this thesis acknowledges that providers of outsourced services have increased capabilities, which allows them to expand upon the breadth and depth of their service offerings. Turning to specific outsourcing practices, the logistics industry has become a major market within many economies, with a substantial total market volume of €930 bn. in Europe (Kille and Schwemmer 2015). In addition, Kille and Schwemmer (2015) present their annual study of the ‘Top 100 in European Transport and Logistics Services’ and identified contract logistics as having the most potential for increasing outsourcing practices in the future. Contract logistics, in this context, refers to advanced services that go beyond simple and standardised logistics activities, such as transportation, warehousing and material

handling. As is evident, the providers' perspective of advanced logistics services plays a crucial role in the future development of the growing logistics market.

1.2 Research Gap and Scope

This section summarises the findings from an *a priori* systematic review of the literature (SLR) that was conducted and used as a starting point for the justification of this thesis (see section 3.5.1 for a description of the method). The SLR focuses explicitly on logistics outsourcing in management studies within the time period from 2003 to 2013. The findings are collectively presented in various tables in Appendix D and summarised below. Furthermore, a discussion (see section 6.1.1) complements the aim of this thesis, justifying the need to focus on the providers' perspective in logistics outsourcing. Hence, the focus, the nature, the frequency and the impact of logistics outsourcing articles in management research is introduced below.

Research on logistics outsourcing traditionally *focuses* on the focal firm, the customer or the provider firm. The general allotment of these three perspectives amongst journal publications between 2003 and 2013 is equally distributed (see Table D.1 in Appendix D). However, more recently, research has begun to consider the providers' perspective, as is particularly evident in four journals, namely, *International Journal of Production and Operations Management* (IJOPM) *Industrial Marketing Management* (IMM), *European Journal of Operational Research* (EJOR) and *International Journal of Production Economics* (IJPE). The percentage of the relevant articles focusing on the providers' perspective between 2003 and 2013 is distributed as following: 71% in IJOPM, 52% in IJPE, 63% in IMM and 40% in EJOR (see Table D.2 in Appendix D). In addition, it is worth mentioning that special issues promoted the increasing focus on the providers' perspective following calls for papers from the Logistics Research Network (LRN), the Nordic Logistics Research Network (NOFOMA) and the European Operations Management Association (EurOMA).

Apart from the research focus, a further disparity can be observed between the empirical and theoretical *nature* of studies. The balance between theoretically and empirically oriented studies has gradually shifted from what was once largely dominated by theoretical studies to what is now dominated by empirical research within the time frame of 2003 and 2013 (see Table D.3 in Appendix D). Whereas quantitative studies were predominant within empirical studies from 2003 to 2010, a trend towards the increasing

use of qualitative data is observable between the years 2011 to 2013 (qualitative data represents one third of the articles considered in the SLR). Furthermore, the SLR identified a trend towards more empirical studies, in particular journals. The percentage of empirical studies between 2003 and 2013, for instance, was 90% in *EJOR*, 75% in *IMM*, 86% in *IJOPM* and 80% in the *Journal of Purchasing and Supply Management* (*JPSM*). Table D.4 in Appendix D presents the shifting orientation of logistics outsourcing research over time within core management journals.

In order to gauge the overall *impact* of a discipline on the broader management fields, it was necessary to determine the occurrence of articles focusing on logistics outsourcing and the provision of third-party services, in terms of frequency within the relevant management journals. Overall, frequency remains relatively low and these articles represent no more than 1% of all articles within the core management journals, which amounts to an average of ten publications per year. However, this is not altogether surprising for a relatively new discipline. The percentage of articles on logistics service provision from a providers' perspective, between 2003 and 2013, shows some variance in inclination amongst different journals. For example, 5% are published in the *Journal of Business Logistics* (*JBL*), 4% in the *International Journal of Physical Distribution and Logistics Management* (*IJPDLM*) and 3% in the *International Journal of Logistics Management* (*IJML*). Table D.5 in Appendix D presents detailed results of the relative frequency of logistics outsourcing articles per year, from the providers' perspective, within the core management journals. To further substantiate this research, the SLR also considered the impact of logistics outsourcing and service provision on management research. Such an evaluation was based on the citations (i.e. citation count) of the relevant articles in other core management journals and/or publications. Table D.6 and Table D.7 in Appendix D offer detailed citation counts of service provision and outsourcing articles in the wider academic management journals.

1.3 The Service Providers' Perspective

This thesis is primarily concerned with the service providers' perspective and their development of appropriate capabilities. Going beyond insourcing and outsourcing requires consideration of the providers' *active* involvement in participating and bringing forward systems integration within various disciplines. While their core competencies traditionally focused on the provision of supporting services, such as transportation and

warehousing, providers have recently advanced into providing more customer-centric solutions. This development is evident in the service industry, for example, where companies, such as Amazon or Uber provide more integrated and solution-driven services. However, this thesis does not focus on the customer or end-consumer *per se*, but rather highlights the integration process to discuss the provision of services from the providers' perspective in the context of logistics. Even though outsourcing has traditionally been perceived as a dyadic relationship between a customer and provider, the investigation of systems integration is focused solely on the providers' side, as is demonstrated through the development of a service provision continuum in this thesis.

In sum, the service provision boundaries refer to the boundaries between internally and externally provided services, with regard to an outsourcing context. However, primary emphasis is placed on how provider firms manage and adapt their services in such a way that allows them to supersede traditional insourcing or outsourcing boundaries. Hence, the traditional perspective of outsourcing logistics functions is challenged by viewing the service providers as integrators of services.

1.4 Research Objectives and Questions

This study presents a multiple case study on the topic of service provision and systems integration in order to address the identified gaps. The overall aim of this thesis is defined as follows:

Research Aim: The aim of this research is to stimulate a debate that contributes to the ongoing discussion in the field of operations management about systems integration that goes beyond a binary view of insourcing and outsourcing in order to develop a continuum of service provision.

Accordingly, the first research objective stipulates the research approach and underlines the theoretical contribution:

Research Objective One: To investigate the extant literature in the field of operations and supply chain management on outsourcing and service provision practices.

The following two research questions address this first research objective by focusing explicitly on the extent academic literature:

Research Question One: *What has been the focus, nature, salience and influence of research in service outsourcing and how has it changed over time?*

Research Question Two: *How can the combination and the multiplicity of existing theories from different disciplines explain the provision of services boundaries from the provider firms' perspective?*

The second research objective draws on empirical data and advances certain methodological and managerial considerations:

Research Objective Two: To develop and contextualise a continuum of service provision for the European logistics industry; to justify the existence of an integrator role in service provision.

The corresponding two research questions address this second research objective, focusing on the qualitative within-case analysis and the cross comparison of the case firms:

Research Question Three: *How do provider firms within different archetypes of service provisions exploit their idiosyncratic and individual capabilities?*

Research Question Four: *How can the boundaries across different archetypes of service provision be delineated?*

The following Table 1.1 summarises the research objects and questions as they pertain to the appropriate research stage in this thesis.

Objectives	Research Questions	Research Approach
Objective One: To investigate the extant literature in the field of operations and supply chain management on outsourcing and service provision practices.	RQ1: <i>What has been the focus, nature, salience and influence of research in service outsourcing and how has it changed over time?</i>	<u>Theoretical:</u> Systematic literature review
	RQ2: <i>How can the combination and the multiplicity of existing theories from different disciplines explain the provision of services boundaries from the provider firms' perspective?</i>	Conceptualisation of literature streams
	Objective Two: To develop and contextualise a continuum of service provision for the European logistics industry; to justify the existence of an integrator role in service provision.	<u>Empirical:</u>
	RQ3: <i>How do provider firms within different archetypes of service provisions exploit their idiosyncratic and individual capabilities?</i>	Within-case analysis
	RQ4: <i>How can the boundaries across different archetypes of service provision be delineated?</i>	Cross comparison of archetypes and contextualisation

Table 1.1: Research Objectives and Questions for this Thesis

Finally, as was introduced in Figure 1.1, the contributions of this thesis are offered below and are further discussed and reflected upon in chapter six.

1. Theoretically, this thesis elaborates on and contextualises existing economic theories within the context of logistics services.
2. Methodologically, this study implements a qualitative abductive research approach in the field of operations management using a multiple case study design that introduces four archetypes of service provision.
3. Managerially, this research facilitates organisational understanding of the role of systems integrators in logistics systems and offers a pragmatic service provision continuum.

1.5 Basic Concepts and Definitions for this Thesis

The following subsection defines and explains concepts that are relevant for the understanding of this thesis.

1.5.1 Logistics and Supply Chain Management

Research in the fields of *SCM* and *logistics* more generally is extensive and broad in its scope, which requires an *a priori* clarification that distinguishes these two concepts. Larson and Halldorsson (2004) introduce four distinct conditions in which (1) logistics can be seen as a discipline within SCM, (2) SCM is a discipline within logistics, (3) SCM and logistics are two separate disciplines with overlapping characteristics or (4) both concepts exhibit completely disparate characteristics and are therefore viewed as mutually exclusive. This thesis considers the first condition, where logistics is deemed a function within the discipline of SCM, and where SCM is itself viewed as a discipline within the field of operations management². Hence, this thesis adopts a perspective that refers to operations management as facilitating all inter- and intra-organisational relationships (i.e. OM focuses on the effective management of systems-wide interactions and processes) including suppliers, customers and end-consumers and considering external environmental aspects as well as internal production processes. More

² Note that throughout this thesis the academic fields of operations management and supply chain management are sometimes used in conjunction; as they share certain discipline bases, such as purchasing and procurement, for instance, which are, on the one hand, parts of organisational functions within supply chains, and on the other hand also entail operational processes.

specifically, SCM, to the understanding in this thesis, includes common purchasing, procurement and collaboration activities on a tactical level. These activities encompass the management and organisation of logistics systems as well as material-, information- and financial flows, for example. Ergo, logistics refers only to the very basic operational activities that include the transportation, handling and storage of any type of products (i.e. raw material, work in progress inventory and finished goods) or services.

1.5.2 Outsourcing

The term outsourcing was coined in the late 1980s as a result of the ongoing practices of subcontracting information services and systems to external partners (Aubert et al. 2012). Since then, it has developed as a source for competitive advantage for focal firms. Espino-Rodriguez and Padron-Robaina (2006) outline this development, starting with traditional make-or-buy decisions that are primarily focused on cost reduction, to the transfer and shift of responsibility and ownership of products and services. Hence, the concept of outsourcing refers to appropriate governance mechanisms that go beyond a firm's boundaries within a supply chain, network or system.

As a result of the continuous development of outsourcing practices, several forms of collaboration have emerged, including cooperation between competing firms within and across multiple supply chains. Hence, this thesis refers to any type of cooperation as a collaborative relationship that can be relational or contractual in nature.

1.5.3 Logistics Service Providers

Substantively, this thesis addresses service provision within the logistics industry, thus a brief description of the provider firms, namely logistics service providers (LSP), is necessary to facilitate understanding of the later analysis and discussion. Prior research classified service providers into different categories according to their level of supply chain integration (see section 2.2 in the literature review for a more detailed discussion on the emergence and development of such provider firms). In general, LSP firms act as external partners to focal firms in the manufacturing or retail industry and are, therefore, typically referred to as third-party logistics (3PL) providers. Notably, the scope and scale of service provision differs amongst LSP firms, including the range of various activities (i.e. transportation, warehousing, material handling, packaging, purchasing and/or

procurement) and the various geographic or industry-wide operations in which they partake (i.e. local, national or global operations).

1.5.4 Systems Integration

While the concept of systems integration stems from the manufacturing and large-scale industries, recent developments in the service industry demonstrate that the notion of organising and funnelling integrated systems within one organisation is an increasingly common practice in other industries as well. Examples of how integrating services, rather than the simple provision of products³, are increasingly cultivated and are present today in the accommodation industry (e.g. Air B'n'B), media services (e.g. Facebook), transportation companies (e.g. Uber) and in the retail industry (e.g. Alibaba). These organisations demonstrate integration capabilities that span over entire supply chain operations and business processes. Hence, this thesis refers to organisations that engage in systems integration as those that adopt and manage the *organisation* and *integration* of enhanced services without necessarily increasing their own assets or liabilities.

1.6 Structure of this Thesis

This chapter has introduced the key aim, objectives, research questions and contributions of this thesis and has also offered relevant definitions and concepts necessary to explicate the logic of this study. Drawing on a comprehensive review of the literature, an initial conceptual framework was developed (chapter two). Following an abductive research approach (chapter three), the conceptual framework was then tested using a within-case analysis, based on interviews and expert discussions (chapter four). From the iterative case study analysis and cross comparison (chapter five) of the cases that goes back and forth between theory and empirical data, a contextual framework was developed that contributes to the understanding of systems integration. Finally, the service provision continuum is presented (chapter six) and avenues for future research is outlined (chapter seven). Figure 1.2 illustrates the different parts and the structure of this study, considering the individual chapters in this thesis.

³ Note that *products* in this thesis do not exclusively refer to the physical production of consumer or capital goods, but also comprise the output of technical, financial or transportation offerings, in the form of a product portfolio within a service provider.

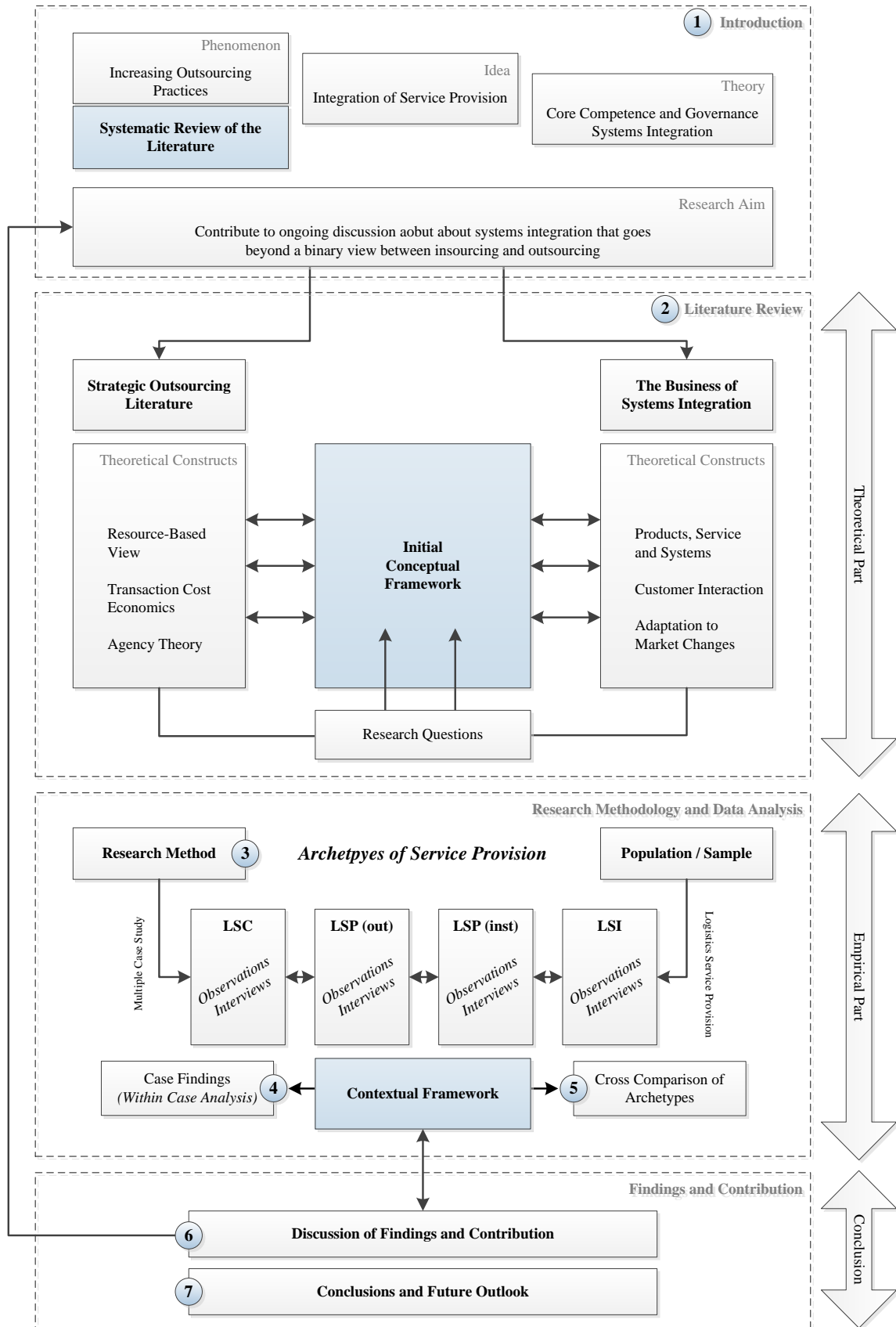


Figure 1.2: Structure of this Thesis

Chapter Two: A Theoretical Lens on Service Provision reviews the extant literature on (1) outsourcing studies and (2) the business of systems integration. The purpose of such a comprehensive review is to identify the theoretical assumptions and constructs from RBV, TCE, AT and SI in order to derive an initial conceptual framework.

Chapter Three: Research Philosophy and Methods describes the philosophical stance and adopted research methodology for this thesis. Furthermore, it introduces the applied strategy of case study research and the novel approach of a qualitative abductive research approach in the field of operations management. The chapter outlines the data collection and analysis processes that have been applied in order to address the aforementioned research questions.

Chapter Four: Within-Case Analysis of Service Provision Archetypes introduces the four proposed archetypes of service provision that have been developed based on an *a priori* analysis of the data. It also presents the case study findings and describes the characteristic and boundaries of each archetype. The purpose of this findings chapter is to describe the service provision boundaries and make a case for dynamics within the different archetypes.

Chapter Five: Cross Case Comparison of Service Boundaries compares the theoretical constructs across the four different archetypes of service provision in order to highlight their main characteristics. By identifying overlapping characteristics, this chapter proposes the development of a continuum of service provision. The purpose of this chapter then is to present the comparison across four archetypes of service firms.

Chapter Six: Discussion of the Findings provides responses to the research questions and describes the theoretical, methodological and managerial implications of this thesis. The chapter also presents the contextual framework that was developed from the initial conceptual framework by enhancing it using the empirical data collected in this study.

Chapter Seven: Conclusion and Future Outlook summarises the key contributions of the thesis by discussing how the present research elaborates and enhances theory, methodology and management practices, more generally. The purpose of this chapter is to draw together the threads of this research about the service provision continuum and to highlight avenues for future research.

CHAPTER TWO:

A THEORETICAL LENS ON SERVICE PROVISION

The purpose of this chapter is to review the relevant literature and extant academic studies on strategic outsourcing and service provision, to support the development of an initial conceptual framework for this thesis and its lasting contribution. Key assumptions and theoretical constructs that explain the phenomenon of outsourcing practices in the context of service provision are introduced and discussed. Furthermore, the evaluation of the theories adopted for this research goes beyond the traditional make-or-buy discussion. As was introduced in the previous chapter, literature on strategic outsourcing and applicable economic theories, such as the resource-based view (RBV) of the firm, transaction cost economics (TCE) and agency theory (AT) are crucial to the formation of this study and its exploration of service provision boundaries. In addition, literature on the business of systems integration and its related constructs is introduced, which serves as a complementary part for the development of the initial conceptual framework by contributing to the understanding of the role and nature of systems integrators. Hence, the literature review aims to combine multiple theories and complement those with the understanding of systems integrators with regard to the overall aim of this thesis that explores the nature or systems integration capabilities from the providers' perspective.

The remainder of this chapter is structured as follows: The next section 2.1 introduces background information and a critical understanding of outsourcing definitions within management research. Following a review of the extant literature on outsourcing and the core capabilities of service providers and in particular in the context of logistics, in section 2.2, the main theoretical perspectives on strategic outsourcing are identified in section 2.3. Theoretical assumptions and constructs related to RBV are presented in section 2.4, TCE in section 2.5 and AT in section 2.6. Each of these sections evaluates these theories based on their applicability to service provision and service boundaries, which forms the basis of the initial conceptual framework. Section 2.7 reviews the theoretical assumptions and concepts of advanced service provision (i.e. systems integration) and considers the

development of products, service and systems, which also represents an additional pillar in the initial conceptual framework.

2.1 Different Views and Toolboxes on Strategic Outsourcing

Traditionally, research in operations and supply management focuses on the importance of sourcing strategies (Krause et al. 2001), especially the core competencies of the firm. In this way, scholars primarily focus on how and why outsourcing practices are increasingly adopted in both manufacturing and service industries. However, such an overt focus on core competencies (Prahalad and Hamel 1990, Quinn and Hilmer 1994, Quinn 1999) is limited and narrow as it mainly focuses on (1) reducing transaction specific monitoring costs relating to administration, IT infrastructure or communication efforts and (2) providing unique solutions, such as value-adding products or services, to the final customers (Quinn et al. 1990). As a result, organisations tend to make rational, i.e. perfectly sensible decisions with regard to making or buying products, services and/or peripheral and supporting activities. In the late 1980s the term ‘outsourcing’ was coined following the growing practice of subcontracting information services and systems (Aubert et al. 2012) and has increasingly become more applicable to other activities and functions within a focal firm. Espino-Rodriguez and Padron-Robaina (2006) outline this development starting from the traditional make-or-buy decision that is mostly cost-focused on the transfer of responsibility and ownership of products and/or services, which together refer to the appropriate governance forms that go beyond the firm’s short-term boundary decisions (Lonsdale and Cox 2000).

Outsourcing practices are not, however, restricted to the sourcing of peripheral or non-core activities from external suppliers or other third-parties in the market (Barthelemy 2003). Outsourcing also plays an integral role in forming today’s management strategies and contributes to building knowledge and theoretical toolboxes within the various academic fields of management research (Shook et al. 2009). Today, outsourcing is addressed from various angles with a focus on governance forms, such as making, buying, hierarchical relationships, strategic alliances (Leiblein 2003) and hybrid organisations (Mudambi and Tallman 2010). Hence, using multiple theoretical perspectives, some of which span across disciplines, including economics and sociology, to explore the phenomenon of service outsourcing and the subsequent service boundaries, is a promising approach in management research (Chen and Paulraj 2004).

2.1.1 *Beyond the Traditional View of 'Make-or-Buy' (1)*

The traditional outsourcing definition solely considers the procurement of products or services from external partners but does not pay enough attention to the arising contractual and relational issues (Gilley and Rasheed 2000). Traditional make-or-buy decisions “determine the firm’s level of vertical integration, since each decision specifies, which operations the firm will engage in and which it will contract out to a supplier” (Walker and Weber 1984, p.374). Moving towards more critical or strategically more important activities, such as product design, manufacturing, marketing and logistics (McIvor 2009), raises further questions about the strategic impact and underlying conditions of different governance forms. The terms ‘make’ and ‘buy’ exclusively focus on the control mechanisms of price and authority regarding the respective sourcing mode. Michael Leiblein (2003, p.937), for instance, distinguishes in his *Journal of Management* article between the choice of governance forms, e.g. the following three categories regarding the governance decisions of firms are given:

1. Markets or Hierarchies (Monteverde and Teece 1982a, 1982b, Walker and Weber 1984)
2. Hierarchies or Alliances (Pisano 1990)
3. Equity or non-equity Alliances (Oxley 1997)

Such a distinction between markets (i.e. pure outsourcing), hierarchies (i.e. complete vertical integration) and alliances (i.e. collaborative relationships) derives from the assumed asset specificity of certain transactions. The impact of specificity on financial risks and governance modes is further explained in subsection 2.5.3. It can be said, however, that the two extreme poles of *making* or *buying* do not sufficiently explain real-life market conditions. The fundamental and contrasting views of such an ‘either-or’ perspective has resulted in the emergence of a widely accepted form of hybrid organisation, which is mainly rooted in the organisational view of relational contracting, as it was introduced by Oliver Williamson (1985). Williamson defends the existence of hybrid governance forms and furthermore contends that there is a pluralism of governance in today’s markets. He characterised this plural organisational form of hybrid governance, where firms retain control over certain transactions mechanisms without fully internalising them (Mudambi and Tallman 2010). Krzeminska (2008) also argues that such hybrid forms are more appropriate in explaining bilateral control mechanisms and found that transaction cost logic is the predominant approach for explaining the

phenomenon of plural sourcing modes. However, TCE lacks assumptions that properly explain why firms make and buy simultaneously (Parmigiani 2007).

This thesis shares this view that while TCE can explain outsourcing practices, markets and hierarchies are not mutually exclusive. The following subsection further reviews approaches to contractual and relational forms of governance between buyers and suppliers that interact in a number of outsourcing arrangements, focused on the providers' side of the outsourcing arrangement.

2.1.2 Contractual and Relational Determinants of Outsourced Services

There is an ongoing discussion about the *correct* governance mode from a transaction specific perspective (Osborn and Baughn 1990, Masten 1993, Das and Teng 1998, Gulati 1998), which is further in light of the hybrid form of governance that has resulted in several types of mutual interactions between organisations. Cooperation between firms, as Heide (1994) describes, encompasses high levels of complexity and customisation. Complexity, therefore, could be seen as a product of continuous outsourcing practices. In order to discuss outsourcing practices, scholars describe these interactions between firms in the following ways:

- 'Relational contracting' (Williamson 1985)
- 'Cooperative ventures' or 'alliances' (Hennart 1993, Parkhe 1993, Tallman and Shenkar 1994)
- 'Inter-firm collaborative relationships' (Madhok and Tallman 1998)
- 'Collaborative partnering'⁴, from a consulting perspective

In general, research demonstrates that any type of collaborative relationship, as it is further referred to in this thesis, has a positive effect on productivity (Sheth and Parvatiyar 1995). Such a claim is also supported by psychological perspectives, which suggest that "competition is inherently destructive and mutual cooperation is inherently more productive" (Deepen 2007, p.41)⁵.

⁴ For additional information on the benefits of forming alliances opposed to market or hierarchy structures and a theoretical discussion on the resulting inter-organisational governance mechanisms, see Mudambi and Tallman (2010).

⁵ This thesis does not further consider the benefits and pitfalls of specific collaborative relationships, which may also be categorised as collaboration, competition and co-opetition.

The availability and development of knowledge about the types of relationships formed between buyers and suppliers of outsourced services, however, is limited and lacks empirical evidence (Gilley et al. 2006, Bolumole et al. 2007). In operations research, attempts are made to identify and test a number of variables related to the formation of such relationships. Such variables or determinants include ‘trust’ (Anderson and Weitz 1989, Morgan and Hunt 1994), the ‘degree of communication’ (Anderson and Narus 1990), ‘power imbalances’ and ‘opportunistic behaviour’⁶ between buyers and suppliers (Morgan and Hunt 1994), ‘goal congruencies’, and the ‘age of the relationship’, for example. All these determinants ultimately have an impact on the stability of the dyadic buyer-supplier relationship. Research focusing on outsourced services in the context of logistics, for instance, shows that, in particular, trust and commitment (La Londe and Cooper 1989, Bowersox 1990, Moore 1998) are drivers for partnerships that evolve from mutual relationships over time. Deepen (2007) extends this research by investigating and empirically testing these relational variables and their positive impact on the overall outsourcing performance. A shift from transactional exchanges to long-term alliances highlights the importance of trust, loyalty, the willingness to share information (Gardner and Cooper 1988, Ellram and Cooper 1990, Knemeyer et al. 2003, Knemeyer and Murphy 2004) and risk (Cooper and Ellram 1993) as the main determinants for successfully maintaining outsourcing relationships over time. Mutually expected performance outcomes and profitability for both buyers and suppliers is consequently a result of established long-term collaborative relationships (Anderson and Narus 1990, Anderson and Weitz 1992). The benefits realised from such long-term commitments will be discussed later in the analysis of the case studies in this thesis, which ultimately results in the proposed advanced integration capabilities by provider firms (see chapter four).

From a transaction cost perspective, these long-term relationships, regardless of their underlying governance form, consist of continuous “repeated transactions over time” (Kalwani and Narayandas 1995, as cited in Roehrich 2009, p.23). Increasing complexity, due to the multiplicity of transactions and interactions between buyers and suppliers (Dyer et al. 1998), emphasises the frequent and short-term transactional exchanges that are common in ‘arm’s-length’ relationships. Hence, it is the frequency of these short-term

⁶ Opportunistic behaviour in an organisational context will be explained later in section 2.5.2 with regard to the assumptions of transaction cost economics.

transactions, which explains the increasing complexity here. Consequently, both long-term and short-term relationships are greatly affected by transaction costs. TCE therefore remains the dominant and appropriate theoretical foundation to tackle relational issues between buyers and suppliers of outsourced services. As was previously mentioned, long-term relationships that are grounded in mutual trust and commitment require high levels of human skill and capital investment (Nooteboom 1996, Nooteboom et al. 1997, Singh and Sirdeshmukh 2000). These investment-intensive and close relationships can therefore only be managed to a certain extent solely by a single firm (Gadde and Snehota 2000). Hence, efficiently maintaining contractual relations and integrating outsourced transactions raises further questions about developing knowledge and investigating the behaviour of service providers and their service boundaries, as is explored in this thesis.

Harland (1996) also expands the initial TCE logic by introducing various hybrid forms of relationships situated between extreme forms of pure market transactions and hierarchical integration. However, research that adopts a TCE perspective to explore contractual relationships pays little attention to human interactions and behaviour. Furthermore, and perhaps because most managerial decisions are indeed biased and serve as both the cause and effect of human behaviour, measuring and quantifying soft factors, such as trust and commitment, within an inter-organisational contract environment proves difficult. Therefore, the following subsection describes the development and emergence of such inter-organisational relationships and aims to explain underlying behaviour in the context of service provision and its boundaries.

2.2 Logistics Services as a Core Competence of Firms

The trend from the late 1970s and 1980s towards outsourcing peripheral and non-core activities to third parties or external partners has drawn the attention of academics and practitioners to the providers of such services (Halldórsson and Skjøtt-Larsen 2004, Chen et al. 2010). The nature and development of third-party logistics (3PL) or logistics service providers (LSP) has increasingly become of interest to management researchers, particularly as of late (Maloni and Carter 2006, Marasco 2008). The growing trend of using 3PL providers as a strategic element in an organisations' value chain amongst organisations (Selviaridis and Spring 2007) calls for the effective management and integration of these providers, because they significantly impact the creation of value and boost the competitive advantage of a firm (Lieb and Miller 2002). Consequently, and in

a similar vein to understanding service provision boundaries and the management of outsourced governance, the concept of 3PL providers warrant further exploration.

2.2.1 Basic Concepts and the Development of Service Providers

During the 1970s, logistics activities, which included basic storing and transportation activities that are complementary to the production processes, were mainly conducted and organised in-house (Sheffi 1990, Bowersox and Closs 1996). These activities became more important to management decisions as the potential cost savings were recognised. Activities that include the transportation of a manufacturer's or producer's own goods or raw materials, work in progress inventory or finished goods, are referred to as first-party logistics (1PL). Today, small logistics providers and carriers that operate locally and limit their services to simple transportation and storing activities are called 1PL providers.

The origins of the development of 3PL providers is alternatively grounded in the continuous outsourcing movement beginning in the early 1980s, when manufacturers and producers started to see logistics as a strategic management practice, and recognised the immense cost saving capabilities of an efficient logistics system (Bowersox et al. 2012, Cui and Hertz 2011). The further integration of logistics activities in the 1990s and the linking of different functional areas, such as logistics, marketing and procurement, led to a central coherent enterprise resource planning (ERP) system that finally allows manufacturers and producers to outsource the entire logistics function (Fabbe-Costes et al. 2008, Cui and Hertz 2011, Huemer 2012). All operational and managerial processes and logistics activities can be outsourced to third-party logistics (3PL) providers, which operate on behalf of their clients. The core competencies include the actual logistics operations, such as transportation and warehousing, as well as organising the relevant carriers and freight forwarders, in order to guarantee customised and transparent supply chain operations and solutions (Mortensen and Lemoine 2008). The responsibilities and capabilities that these 3PL firms provide in today's business environments are multifaceted and range from traditional 'arm's-length'⁷ sourcing, such as organising and buying transportation and warehouse services, to managing more complex logistics processes. 3PL providers can be divided into two main categories, "those who own

⁷ The term 'arm's-length' describes a type of relationship in the context of logistics services characterised by the exploitation of economies of scale due to consolidation of transportation and warehousing volumes.

transportation assets and those who do not” (Sheffi 1990, p.34). This distinction becomes more relevant in the later analysis of different archetypes of service provision in this thesis (see chapter four). Marasco (2008) points out that despite the growing literature on these providers, there is no clear definition of what third-party logistics includes and encompasses. She summarises the different functions and introduces boundaries of 3PL services, which range from the traditional transportation and warehousing activities (Laarhoven et al. 2000), managing the entire or selected logistics processes or activities (Laarhoven et al. 2000, Lieb and Bentz 2005, Coyle et al. 2003), to the provision of management support by maintaining a close outsourcing relationship (Magnus Berglund et al. 1999). Table 2.1 provides a brief overview of selected definitions on 3PL services from different academic sources.

Reference	Definition of 3PL Services and Providers
<i>Lieb (1992)</i>	The use of external companies to perform logistics functions that have traditionally been performed within an organisation. The functions performed by the third party can encompass the entire logistics process or selected activities within the process (p.29).
<i>Bagchi and Virum (1996)</i>	A logistics alliance indicates a close and long-term relationship between a customer and a provider encompassing the delivery of a wide array of logistics needs. In a logistics alliance, the parties ideally consider each other as partners. They collaborate in understanding and defining the customers' logistics needs. Both partners participate in designing and developing logistics solutions and measuring performance. The goal of the relationship is to develop a win-win arrangement (p.95).
<i>Magnus Berglund et al. (1999)</i>	Third party logistics [are] activities carried out by a logistics service provider on behalf of a shipper and consisting of at least management and execution of transportation and warehousing [...]. In addition, other activities can be included, for example inventory management, information related activities, such as tracking and tracing, value added activities, such as secondary assembly and installation of products, or even supply chain management. Also, we require the contract to contain some management, analytical or design activities, and the length of the cooperation between shipper and provider to be at least one year, to distinguish third-party logistics from traditional 'arm's-length' sourcing of transportation and/or warehousing (p.59).
<i>Murphy and Poist (1998)</i>	A relationship between a shipper and third party, which, compared to basic services has more customised offerings, encompasses a broader number of service functions and is characterised by a longer term, more mutually beneficial relationship (p.26).
<i>Skjoett-Larsen (2000)</i>	All logistics service relationships that include the last three categories of Bowersox's scale, i.e. partnerships, third party agreements and integrated service agreements (p.114).
<i>Bask (2001)</i>	Relationships between interfaces in the supply chains and third-party logistics providers, where logistics services are offered, ranging from basic to customised, in short or longer-term relationships, with the aim of effectiveness and efficiency (p.474).

Table 2.1: Definitions of 3PL Services in the Literature

As mentioned in the introduction, literature on 3PL services lacks of theoretical work and mainly consists of practitioner-based studies. Hence, Marasco (2008) asserts that “further development of the field requires greater emphasis on the development of theory, constructs and conceptual frameworks in order to build a conceptual foundation” (p.142). Since the scope and specific functions of 3PL providers represents a rather wide and fuzzy area of business operations, the next section closely assesses their specific capabilities and different perspectives. Consequently, an initial conceptual framework has been derived, which categorises different providers according to their individual capabilities. Even though there are different approaches to defining 3PL services, the operational activities always include a provider of services and their clients. 3PL providers act as a supporting intermediary in any buyer-supplier relationship, as they operate and manage logistics activities on behalf of them. Bask (2001) argues that there is a triadic link between the supplier, its customer and the 3PL provider, as is illustrated in the following Figure 2.1.

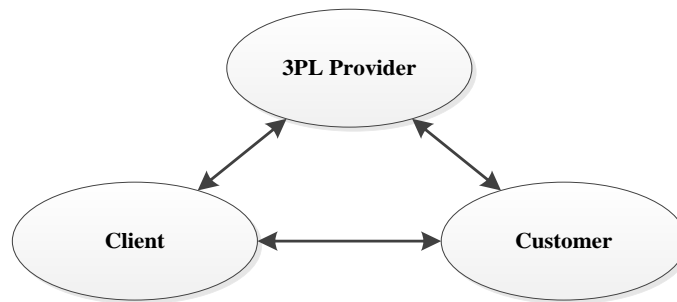


Figure 2.1: Traditional View of a Logistics Triad

Source: Modified from Selviaridis and Spring (2007) and synthesised from Bask (2001).

The traditional view of 3PL services argues that the provider firm fulfils the logistics needs required in any buyer-supplier transaction. Hence, the provider firm's operations are positioned between customer and client and are part of the client's supply chain (Selviaridis and Spring 2007).

2.2.2 Capabilities and Classification of 3PL Providers

In order to generate a sustained competitive advantage, provider firms must operate their network consisting of multiple collaborative interactions (as introduced previously in section 2.1.2) and partnerships, efficiently and effectively. On the one hand, such provider networks benefit from economies of scale due to the consolidation of products from several customers, whether or not the service provider owns assets or outsources the physical transportation or warehousing. The extent of the geographical coverage also

differs amongst logistics firms (Andersson 1995). The establishment of collaboration and alliances, on the other hand, gives providers access to other firms' capabilities and skills, which they can then offer to their own customers, thus increasing the value of the provided services. Such enhanced provision of additional and value-adding services generates higher profit margins and also contributes to a higher competitive market share. Hertz and Alfredsson (2003, p.140) identify the following benefits of logistics alliances:

Benefits [are] improvement of economies of scale and scope, efficient operations, bargaining power, range of services, faster learning, network with other providers, knowledge of various kind, fast implementation of new systems, restructuring of supply chains, reduced investment base, and smoother production.

Several other authors (Lai 2004, Jharkharia and Shankar 2007, Büyüközkan et al. 2008) categorise selection criteria and capabilities of logistics services and provider firms in different ways. The remainder of this subsection outlines the most relevant frameworks.

First, Hertz and Alfredsson (2003) point out that the services provided by logistics firms depend on the ability of customer adaptation and the general competence of problem solving, as illustrated in Figure 2.2.

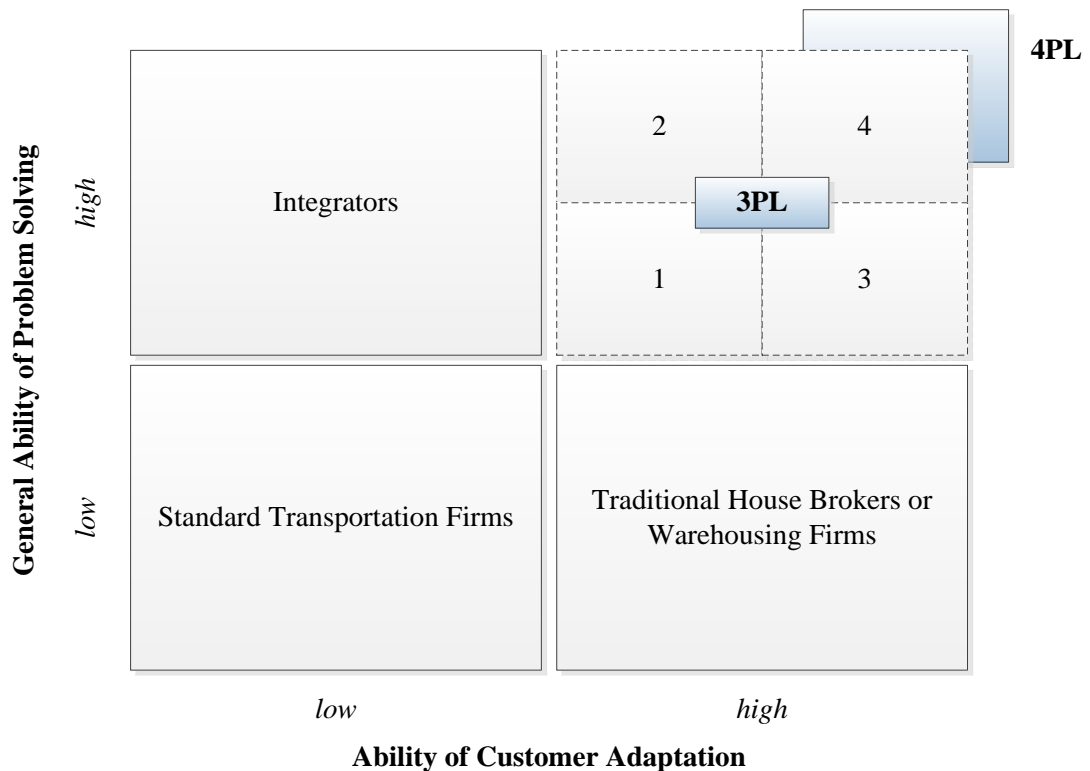


Figure 2.2: Classification of 3PL Providers

Source: Modified from Hertz and Alfredsson (2003).

Hertz and Alfredsson (2003) argue that the coordination and satisfaction of customers reflect their abilities to solve problems. Balancing these two dimensions is a strategic task for the positioning of logistics firms in the marketplace. In addition, these dimensions allow for an even further classification of logistics firms as illustrated in. Organisations are divided into one of the four quadrants: (1) Integrators, such as DHL, FedEx or TNT, (2) standard transport firms, (3) traditional house brokers or warehousing firms and (4) third-party logistics providers. However, the authors focus on the actual nature of service providers and therefore only evaluate the top right quadrant, which represents four different types of 3PL providers with regard to the critical dimensions of problem solving and customer adaptation.

- (1) 'Standard 3PL providers' only offer the basic logistics services, such as warehousing, transportation, picking and packaging and physical distribution.
- (2) 3PL firms as 'service developers' enhance their services by offering value-adding activities, such as cross-docking, tracking and tracing, or customised handling and storing equipment. Supporting IT systems help to identify customers' unique demands and contribute to the exploitation of assets.
- (3) 3PL firms as 'customer adaptors' do not fully enhance and develop their services towards value creation, but focus on only a limited number of customers. They offer full services, such as the operation and management of the entire warehousing and distribution processes.
- (4) 3PL firms as 'customer developers' provide the most advanced and customised services to their customers. The provision of highly integrated services includes logistics know-how, supply chain design and customer coordination. The customer developer is also referred to as a 'logistics integrator' or 'complexity manager' and most closely resembles a fourth-party logistics (4PL) provider.

Second, Bolumole (2003) outlines the role of 3PL providers in the supply chain and implies a changing role of services from outsourcing only parts of the logistics functions towards integrating all functions across the supply chain. Her framework distinguishes four factors and various attributes that describe and define the role of 3PL firms in the supply chain. The different roles of 3PL firms that take account of these four factors and accompanying attributes are illustrated in Figure 2.3. First, the *strategic orientation* of an organisation defines the structural focus of logistics activities, i.e. they are either managed internally in functional silos or externally via cross-functional disciplines along the

supply chain. Second, the *client's perception of the 3PL's capabilities* is focused on either cost reduction or resource enhancement. Third, the *nature of the client-3PL relationship* is subject to be transactional, bilateral or on a partnership level, depending on the hierarchical levels of organisational structures. Fourth, the increasing extent of logistics outsourcing is categorised in the operational, tactical and strategic level of supply chain integration.

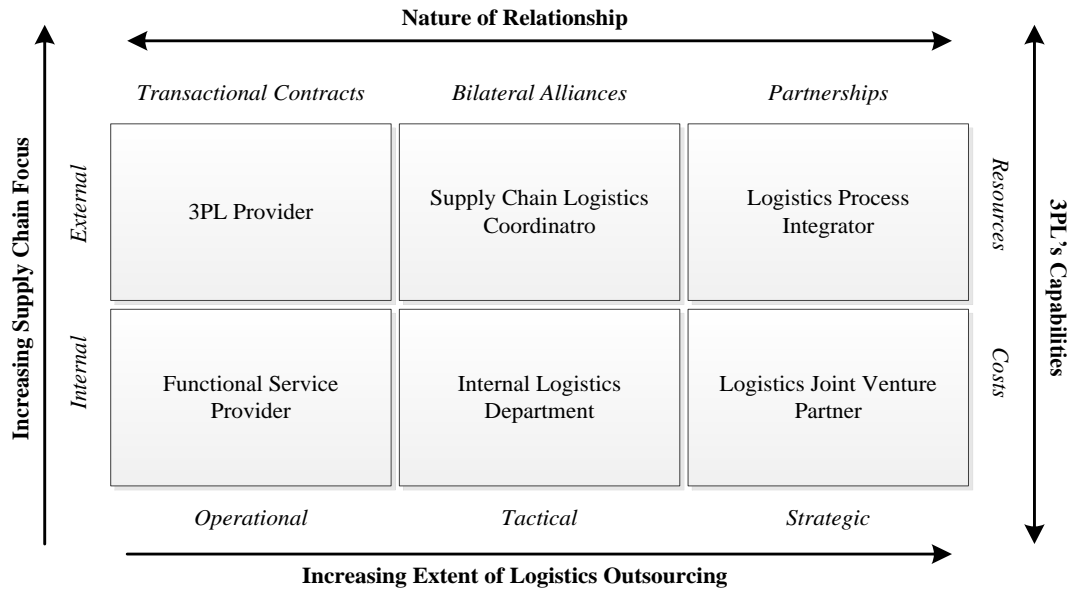


Figure 2.3: Framework of evaluating 3PL's Role in the Supply Chain

Source: Bolumole (2003, p.101).

The previous classifications of service providers, outlined according to their internal and external capabilities and contractual relationships, contribute to the shaping of this thesis by attending specifically to the theoretical constructs of RBV and TCE, which will be further evaluated in section 2.4 and 2.5, respectively. The initial conceptual framework proposed in this thesis attempts to link theoretically derived constructs to the classification of service provision boundaries. The next subsection offers a further outlook on the development of fourth-party logistics (4PL) providers (Win 2008). Later, these distinct characteristics and capabilities of service providers will be compared and evaluated with those of systems integrators, as part of the initial conceptual framework.

2.2.3 Development of Fourth-Party Logistics (4PL) Providers

Scholars and practitioners hold different views on how 4PL providers are defined and how they use their capabilities to create value-adding services. Following Michael Porter's argument, service providers can only outperform their rivals and establish a

different and unique competitive advantage if they offer greater or comparable value at lower costs (Quinn 1999, Win 2008). The emergence of so-called 4PL providers represent the singularity of services within one firm, and the implementation of 4PL strategies focuses not only on core competences but also on activities, such as supply chain related operations and relations between multiple partners (Hsiao et al. 2010a). Even though 3PL providers have moved to providing bundles of services, their main concern still remains in the handling and managing of functional areas rather than strategic levels of the outsourcing process. Historically, the development from 3PL to 4PL providers was welcomed, as 3PL firms do not create additional value but rather play a supporting role. (Huemer 2012, p.260) offers a definition of 4PL firms that comes closest to the further understanding of this thesis:

[4PL providers] design supply solution based on *systematic combinations* of resources from different carriers, storage operators, package companies, and a number of *knowledge* and service-intensive firms. [Emphasis added]

In addition, many definitions of 4PL services agree that these provider firms do not own any physical assets *per se* and mainly utilise communication and information infrastructures to facilitate supply chain integration. Multiple studies address the classification of logistics services with regard to the presentation of 4PL firms (Razzaque and Sheng 1998, Magnus Berglund et al. 1999, Lai 2004, Selviaridis and Spring 2007, Fabbe-Costes et al. 2008, Hsiao et al. 2010a, Langley and Capgemini 2015). Generally, the definition and existence of 4PL services has not been fully discussed in academic literature and lacks empirical research. Most of its applications have been derived from and used by practitioners and consultants, such as Accenture, who coined the term ‘Fourth-Party Logistics Provider’ in the early 1990s (Mukhopadhyay and Setaputra 2006, Win 2008, Papadopolou et al. 2013).

In sum, the use of 4PL services is relatively new to organisations; however, this thesis introduces the changing role of systems integration capabilities that also helps to improve customer service levels and interaction with customers and end consumers, in a similar way to how 4PL providers might be understood.

2.3 Theoretical Perspectives on Outsourcing

Gilley et al. (2006) propose that a general theory of outsourcing has not yet been developed within the area of logistics and supply chain management. Going back a decade, Stock (1997) already highlights the need for the development of theory in logistics studies with the aim to be more rigorous and concerned with theory testing and application (Mentzer and Kahn 1995). Borrowing and applying theories from other disciplines has led to a general consensus that logistics “research is suited to approaches that adopt multidisciplinary methodological pluralism” (Bolumole et al. 2007, p.35). Thus, a review of extant literature indicates the increasing use of different theoretical perspectives (Spina et al. 2013) to explain both the outsourcing decision itself and the *ex-post* contractual relationship. The most frequently considered theoretical perspectives include the resource-based view (RBV) of the firm, transaction cost economics (TCE) and agency theory (AT)⁸. The following sections in this literature review outline these different theoretical approaches and comment on their applicability to service outsourcing and the service boundaries.

According to Holcomb and Hitt (2007), a firm’s strategic arrangement towards gaining competitive advantage, namely ‘strategic outsourcing’, is primarily based in the boundary decisions of a firm. Originating in the broader view of the ‘theory of the firm’, researchers developed various economic theories to understand the nature of markets, organisations and their competition. In his seminal essay, Ronald Coase (1937) introduces the research agenda on the nature of the firm and raises the important question as to why firms exist at all since markets already exist. He examined how transactions are organised within the firm to understand why firms are not managed by the market itself, as logic would suggest this as the most efficient approach. Scholars expanded this view by further investigating subjects about the performances and competitive differences of firms. Besides the neo-classical research stream that assumes perfect competition, which is mainly supported by Porter (1980), in the context of modern management strategies, other theories evolved to describe, for instance, the creation of superior firm performance (Fritz 2008). Other organisational theories look beyond Porter’s view – of positioning the firm in the right

⁸ For further information see Spina et al. (2013), who evaluate in a literature review the state and nature of purchasing and supply management research focusing on the use and applicability of theories.

place amongst competitors – and focus more on the inter-organisational structures of governance mechanisms, which is the case with RBV, TCE and AT.

The RBV of the firm as a theoretical lens underpins the exploitation of a firm's resources and capabilities as the central unit for its competitive advantage (Penrose 1959, Wernerfelt 1984, Barney 1991). The central unit of analysis is the firm's strategic capability for exploiting tangible and intangible resources. Hence, assuming the firm is a bundle of resources, organisations are directed to focus on their core competencies (Prahalad and Hamel 1990).

The theory of TCE helps to determine which of the non-core functions should remain in-house or be purchased (or sourced) externally (Williamson 1985) in order to minimise associated transaction costs. Those transaction costs are traded-off against the cost benefits that arise from buying products or services. The central unit of analysis in the theory of TCE is the transaction, which refers to the efficient exchange of processes.

Lastly, agency theory (AT) helps solving the transaction cost dilemma, which emerges due to conflicts between the outsourcing partners, i.e. between buyers and suppliers. The central unit of analysis does not look at each firm individually but focuses on the design of the contract in a collaborative relationship (Ross 1973, Fama 1980, Eisenhardt 1988). Grounded in the theory of incentives (Laffont and Martimort 2009), AT aims to establish the most efficient contractual design that overcomes the risks of opportunistic behaviour and goal incongruences⁹ between two firms.

Consequently, the three theoretical perspectives are complementary and represent a sequential consideration with regard to service provision and outsourcing. RBV determines whether or not a firm should consider outsourcing. TCE outlines which activities should (and should not) be outsourced. Finally, AT addresses how an outsourcing contract should be designed. Accordingly, each of these theories are explored in-depth in the remainder of this literature review.

⁹ The concepts of opportunistic behaviour and goal incongruences will be further explained in sections 2.5.2 and 2.6.3, respectively.

2.4 Strategic Capabilities and the Resource-Based View of the Firm

Over the last two decades, different perspectives of management research have emerged. The central research question in the field of strategic management considers how organisations achieve a sustained competitive advantage (Teece et al. 1997, Barney 1991, Barney 2001b). Researchers aim to identify the sources of competitiveness in order to evaluate the relevant internal and external environmental factors. However, opposed to Porter's (1985) competitive advantage theory, which relates to the positioning of the firm within the market and therefore focuses on the external environment as determinants for competitiveness, the resource-based view (RBV) emphasises internal factors, such as resources, capabilities and a firm's inter-relationships with competitors as the "primary sources of competitive advantage" (Liu et al. 2010, p.24). The unit of analysis in RBV theory is the individual firm's bundle of resources that are accessible and may contribute to superior firm performance. A firm must exploit the different forms of tangible and intangible resources, such as physical assets or resources and human or organisational capital, efficiently. "According to RBV [...] firms gain sustainable competitive advantages by ensuring appropriate access to a bundle of [...] resources" (Wong and Karia 2010, p.52). Therefore, RBV focuses on resources in terms of availability, accessibility, development and their efficient combination. The following sections outline the origins of the theory as well as the theoretical assumptions that underpin RBV. Furthermore, the factors that lead to a sustained competitive advantage through the lens of RBV and its applicability to service provision are identified. Emphasis is placed on the application of the theory in service outsourcing.

2.4.1 Background and Assumptions of RBV

After Birger Wernerfelt's (1984) inaugural paper on the resource-based view of the firm in the *Strategic Management Journal*, the RBV dominated and came to define management research from the mid-1980s to the mid-1990s. Other scholars and most notable contributions in the development of the RBV theory are represented by the work of Penrose (1959), Wernerfelt (1984), Dierickx and Cool (1989), Barney (1986), (1991), Castanias and Helfat (1991), Conner (1991), Kogut and Zander (1992), Amit and Schoemaker (1993), Peteraf (1993), Conner and Prahalad (1996), Teece et al. (1997) and Helfat and Lieberman (2002). These scholars all developed conventional economic theories that advanced firm-specific resources as critical for a competitive advantage.

Other influential contributions include Lippman and Rumelt (1982), Rumelt (1987), Dierickx and Cool (1989) and Mahoney and Pandian (1992). An overview of the RBV is presented in the following Table 2.2.

In addition, Olavarrieta and Ellinger (1997) chronologically summarised the key works and contributions in the research of the resource-based theory, which is described further below.

RBV	Description
<i>Key Idea</i>	Identifying the source of sustained competitive advantage.
<i>Unit of Analysis</i>	Firm's resources and capabilities.
<i>Nature of Relations</i>	Relationships create new competences and the resources are complementary.
<i>Assumptions</i>	Behavioural assumptions, bounded rationality and trust of suppliers.
<i>Problem</i>	Development of competences. Why do firms differ in their performance?
<i>Time Dimension</i>	Static / Dynamic

Table 2.2: Overview of Resource-Based View

Source: Adopted from Halldorsson et al. (2007).

The original work by Edith Penrose (1959) about the '*Theory of the Growth of the Firm*' suggests that firms' growth is based solely on resources. She argued that the employment of physical and human resources through mergers and acquisitions determine both internal and external growth. The firm's aim, therefore, is to exploit its available resources in order to gain long-term profits and organic growth. Specifically, she suggested the following definition of exploiting resources, as cited by Newbert (2007, p.122):

These resources may only contribute to a firm's competitive position to the extent that they are *exploited* in such a manner that their potentially valuable services are made available to the firm. [Emphasis added]

In addition, Rubin (1973, p.938) supports this idea when he mentions that “the firm must process raw resources to make them useful” by using them as input for activities, which subsequently produce a more valuable output. Grant (1996) goes beyond Penrose's (1959) distinction between services and resources and argues that it is the managerial and strategic capabilities of a firm, which integrate these resources (Kraaijenbrink and Wijnhoven 2008, Kraaijenbrink et al. 2010).

Rumelt (1984) and Wernerfelt (1984) adopted Grant's (1996) idea by *conceptualising* firms as 'bundles of resources'. Drawing on the findings of Penrose and Rubin,

Wernerfelt (1984) attempts to formulise the RBV in a framework and argues that while the product impacts the organisation's profit, the used resources that are necessary for the production and development of the product are indirect sources of the performance. However, the nature of Wernerfelt's (1984) article is highly abstract, where he proposes that firms earn above normal rents through acquiring specific resources. Two crucial papers by Prahalad and Hamel (1990) and Barney (1991) clarify this abstract notion. Prahalad and Hamel (1990) test the correlation between exploitation of resources and a firm's performance and examine whether or not exploitation strengthens the core competencies of an organisation. Their findings suggest that a firm's exploitative nature is based on its skills, technologies and knowledge. Barney (1991) was the first to develop an empirically testable framework to support the resource-based view and the related competitive advantage. He bases his arguments on the assumptions of 'resource heterogeneity' and 'imperfect mobility', which are explained later in this section. His theoretical framework understands and evaluates the use and the characteristics of resources as *valuable*, *rare*, *inimitable* and *non-substitutable* in order to show their contribution to a sustained competitive advantage (see Figure 2.4).

Consequently, the allocation of resources that allow firms to maximise their productivity and profit outcomes became the primary focus in RBV and the wider management research. Since most of the relevant literature has theorised RBV as a static concept (Priem and Butler 2001), it is increasingly becoming more dynamic. According to Mahoney and Pandian (1992, p.365) a "firm may achieve rents not because it has better resources, but rather the firm's distinctive competence involves making better use of its resources". The idea to more efficiently leverage a firm's valuable resources has been supported by Peteraf (1993), who explained the model of competitive advantage with Ricardian rents¹⁰. Therefore, only firms that effectively utilise superior resources will remain in the marketplace, while marginal firms will be forced to leave.

A comprehensive reading of the previous research reveals two conceptual approaches, which prove most influential to the explication and application of RBV theory. First, is Barney's (1991) VRIO framework, which emphasises the full exploitation of a firm's

¹⁰ Note that the concept 'law of rents', initially coined by David Ricardo in 1809, is beyond the scope of this thesis.

resources. Second, is Teece et al.'s (1997) dynamic capabilities framework that includes “the firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments” (p.516). To summarise, throughout the last two decades, the development of the RBV theory to understand the competitive advantage of a firm has emerged from a static view of resource attributes to a more dynamic process that emphasises the ability to alter the resources in an efficient way rather than merely possessing them. The criticism of the static nature of RBV theory has also been addressed in the conclusion chapter of this thesis by suggesting propositions for future research to overcome this limitation. The following sub-section discusses the underlying theoretical assumptions of RBV.

Resource-Based Assumptions

The circumstances under which resources can contribute to a firm's competitive advantage through the lens of RBV are outlined by Barney (1991), who formalises RBV theory by assuming two fundamental conditions. In his article, he states that

1. Resources are heterogeneously distributed amongst firms, and
2. Resources are imperfectly mobile

Both collectively exhaustive assumptions are considered in his resource-based model of the firm in order to examine the sources of competitive advantage. Different firms within an industry control their own resources, which are neither perfectly mobile nor transferable across organisations and thus heterogeneity has the potential to be long lasting. Barney argues that a sustained competitive advantage cannot be expected if resources are both homogeneously distributed amongst firms and are highly mobile¹¹. From a practitioner standpoint, it seems reasonable that in most industries, there is at least a certain degree of heterogeneity and immobility. Only a purely theorised framework could assume such perfect market conditions as they are present and given in traditional neo-classical research (Barney and Hoskisson 1990) and “the search for sources of sustained competitive advantage must focus on firm resource heterogeneity and immobility” (Barney 1991, p.103).

¹¹ A crucial distinction of neo-classical economic theories is the heterogeneity of markets and resources. Traditional neo-classical economic theories, for instance, assume homogeneity and a *perfect* market condition amongst firms and markets.

Resource Heterogeneity

The assumption of resource heterogeneity suggests that firms are different in their nature of economic activity and their behaviour (Nelson 1991). In order to satisfy customer demands and compete in the marketplace, firms seek to efficiently use their individual resources and gain economic rents or at least break even. Peteraf (1993) explains the rent seeking with the presence of superior resources, which are limited in supply: “Thus, efficient firms can sustain [their] competitive advantage [...] if their resources cannot be expanded freely or imitated by other firms” (p.181). Heterogeneity, therefore, is a requirement for competitive advantage in terms of differentiation of resources. In order to gain a sustained competitive advantage, it must not be possible for other firms to replicate or substitute a superior resource.

Imperfect Mobility of Resources

A resource is imperfectly mobile if it cannot be traded and therefore is of no use outside of the focal firm (Williamson 1979). The assumption of imperfect mobility is based on how valuable a resource is within a firm and how the use of assets impact the boundary decisions of a firm (Williamson 1985). Firm-specific investments into resources are also regarded as factors that positively impact the tradability of assets in terms of switching costs. Montgomery and Wernerfelt (1988) point out that high specification of assets and resources is correlated to higher average rents. Therefore, these investments support such diversification of resource in the form of mobility and result in higher immobility. In terms of transaction costs, resources may be regarded as imperfectly mobile if the costs of transferring them are exceedingly high (Williamson 1975). The firm-specific attributes of an imperfectly mobile asset imply that it is bound to a company and contributes only to that firm’s competitive advantage. Hence, opportunity costs are lower for these assets as they do not create the same value for other potential users or firms (Peteraf 1993). The differences between opportunity costs and potential value can also be referred to as quasi-rents as stated by (Klein et al. 1978).

Hence, the necessary condition of imperfectly mobile resources for a sustained competitive advantage is explained insofar as they are only available to the focal firm and have the potential of achieving superior rents.

2.4.2 Classification of a Firm's Resources

In order to implement the resources into a firm's strategy, these resources must be classified properly. In addition to tangible resources, Hall (1992, p.136) defines intangible resources as follows:

[Intangible resources are] assets or skills, [...] which one owns, [including] the intellectual property rights of: patents, trademarks, copyright and registered designs, as well as contracts, trade secrets and databases.

Olavarrieta and Ellinger (1997) summarise three types of categories for the classification of resources. The first is 'input factors', or resources that require a certain transformation or application within the firm. They contribute to the final output of a firm and become part of an organisation's assets and skills. The second is 'assets' that represent an accumulation of inventory or stock of a firm. Following a process of investment, these assets, such as warehouses, vehicles, communication systems and transport networks, are owned and controlled by the organisation. The third is 'capabilities', which are defined as "complex bundles of individual skills, assets and accumulated knowledge" (Olavarrieta and Ellinger 1997, p.563) and include innovations in distribution systems, the management of established relationships and the development of new product designs, i.e. new product development (NPD).

The main difference between capabilities and assets is that assets are considered tangible, whereas capabilities are intangible in their nature, sometimes perceived to be invisible. However, capabilities relate to 'doing' things (Bogaert et al. 1994) and are therefore based on knowledge and contribute to the individual specificity of an organisation. The individual refinement of capabilities is one reason why these resources are difficult to imitate since their characteristics are dynamic and continually evolving within a firm. Amongst a firm's capabilities, for instance, logistics systems, including the design of distribution networks and partnerships are considered to be unique and cannot be duplicated by other firms (Lambert and Stock 2001). In order to identify a proper RBV framework that explains a firm's competitive advantage based on its resources, Barney (1991, p.105) outlines four attributes of resources in his theoretical VRIO (or VRIN) framework (see Figure 2.4):

To have [the] potential of sustained competitive advantage, a firm resource [...] must be *valuable*, in the sense that it exploit[s]

opportunities and/or neutralizes threats in a firm's environment, it must be *rare* among a firm's current and potential competition, it must be *imperfectly imitable*, and there cannot be strategically equivalent *substitutes* for this resource that are valuable but neither rare or imperfectly imitable. [Emphasis added]

Thus through the application of specific attributes (see below), these resources serve as indicators for heterogeneity and perfect immobility.

Valuable Resources

Valuable resources can contribute to the sustained competitive advantage of a firm if they are exploited in a way that no other firm can employ them. Value is attributed to a resource when it improves the efficiency and effectiveness of a firm's function(s) and/or process(es). In other words, these resources contribute to a firm's value in the form of customer's value or profit generation (Day 1994, Sharma and Vredenburg 1998). The attribute of value is related to a resource's capability of exploiting opportunities and neutralising threats (Barney 1991, Wong and Karia 2010, Li 2011). When valuable resources are spread over multiple firms, the perceived value and potential profit generation for the firm does not change unless the resource is easy to imitate (Olavarrieta and Ellinger 1997).

Rare Resources

Rare resources contribute to the implementation of a value-creating strategy that cannot be implemented by other firms. When many large firms possess the same valuable resource, no sustained competitive advantage can be realised from any of those resources. Given that all competitive firms can exploit resources in relatively similar ways suggests that no firm gains a competitive advantage.

If [a] resource is not rare, then large numbers of firms will be able to conceive of and implement the strategies in question, and these strategies will not be a source of competitive advantage, even though the resource [...] may be valuable (Barney 1991, p.106).

However, it is difficult to evaluate how rare a resource needs to be in order to serve as a potential source of a sustained competitive advantage. If resources are absolutely unique, they will generate a competitive advantage at least to some extent. Barney (1991) states that firms can gain a competitive advantage even though other firms own the same valuable resource. However, "the number of firms that possess a particular valuable

resource [must not exceed] the number of firms needed to generate perfect competition dynamics in an industry” (Barney 1991, p.107).

Imperfect Imitability (Inimitability) of Resources

A resource is imperfectly imitable if it relates to at least one of the following conditions as outlined by Barney (1991, p.107). First, obtaining the resource is dependent on unique historical conditions, which involves the ability to exploit such resources within a certain place in time and space. If that window of time has passed, the firm that did not have the particular resource can never obtain it, or at least not acquire it at a reasonable cost. Second, the connection between the resource and the competitive advantage is causally ambiguous. The condition of causal ambiguity (Peteraf 1993, Powell et al. 2006, Durand and Vaara 2009) makes it difficult for firms to imitate valuable resources, as they may not know, which resource is the actual source of the competitive advantage. Third, the resource that generates the competitive advantage is socially complex. Resources with high socially complex structures are more difficult to imitate as they are embedded in relations with suppliers and customers, a firm's reputation or a firm's culture. These conditions define a valuable and rare resource that cannot be obtained by another firm.

Non-Substitutability of Resources

The condition of non-substitutability is given when there are “no strategically equivalent valuable resources that are themselves either not rare or imitable” (Barney 1991, p.111). A resource is substitutable when an independent second one can be exploited in the same way and implemented in the same strategy by a separate firm. A competing firm can use a different resource in order to follow the same strategy as the focal firm. If this occurs, the resource will not generate any sustained competitive advantage. However, many firms seek to copy a particular resource, such as top management, for example, and develop their own equivalent top management team that is valuable, rare and imperfectly imitable for that firm. Then, however, this resource is not a source of sustained competitive advantage (Barney 1991).

The relationship between the resource-based assumptions and the classification of resources and sustained competitive advantage will be explained in the following section, and is furthermore illustrated in Figure 2.4. However, the definition of what classifies resources is rather vague, which is a major critique of RBV (see section 2.4.4).

2.4.3 Sustained Competitive Advantage and Summary of RBV

As outlined in the previous section a firm's resources are crucial to its competitiveness in the marketplace, through the lens of RBV. A firm's competitive advantage is defined as “implementing a value creating strategy not simultaneously being implemented by any current or potential competitors” (Barney 1991, p.102). Notably, the term ‘sustained’, in this context, does not refer to a particular time period. According to Lippman and Rumelt (1982), the phenomenon of a sustained competitive advantage only exists when competitors fail to duplicate the benefits. Therefore, the time period is not relevant to the condition that a competitive advantage sustains. In conclusion, the criterion of sustained competitive advantage is determined by the inability of current and potential competitors to imitate a firm’s strategy, and will, therefore, not last forever.

As previously outlined, resources, i.e. physical assets and human as well as organisational capital, comprise the central unit of analysis in RBV. A firm gains a sustained competitive advantage by “ensuring access to a bundle of idiosyncratic resources, which are valuable, rare, inimitable, and non-substitutable” (Wong and Karia 2010, p.52). Barney (1991) examines the link between these firm-specific resources and the sustained competitive advantage and proposes a conceptual RBV model as illustrated in Figure 2.4.

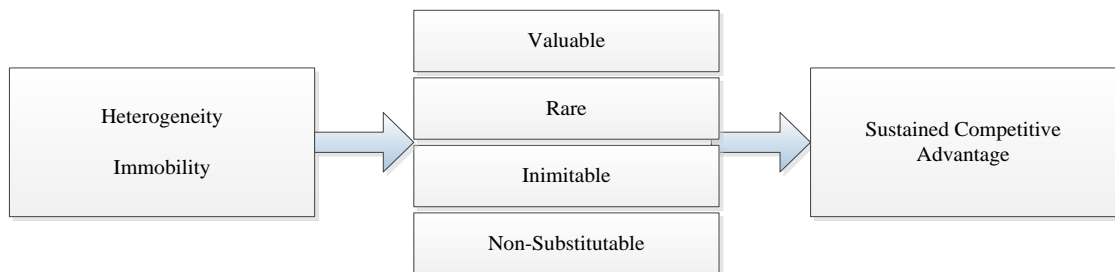


Figure 2.4: Barney's (1991) Conceptual RBV Model and VRIO framework

Source: Adopted from Barney (1991) and Newbert (2007).

Barney's VRIO framework combines all previously mentioned assumptions and characteristics of a firm's resources. It is important to understand that it is not only sufficient for firms to solely possess these resources but they must also have the ability to exploit them accordingly. Consequently, a firm's distinctive competence involves making better use of its resources (Mahoney and Pandian 1992). The VRIO framework that summarises the characteristics of resources and their impact on a firm's competitiveness is outlined in the following Table 2.3.

Valuable	Rare	Inimitable	Organisational	Competitive implication
No	No	No	No	Disadvantage
Yes	No	No	No	Parity
Yes	Yes	No	No	Temporary advantage
Yes	Yes	Yes	Yes	Sustained advantage

Table 2.3: VRIO Framework Criteria

Source: Adopted from Barney (1991).

As highlighted by Barney (1991) and in the table above, a competitive advantage that is sustained in its nature, i.e. is not necessarily bound to a certain time period, can only be achieved if a firm's resources or capabilities possess all four attributes of 'value', 'rarity', 'inimitability', and 'non-substitutability/organisational'¹². Hence, the existence of some of these attributes will result in only a temporary competitive advantage, a competitive parity amongst firms or even a competitive disadvantage.

2.4.4 Critique and Development of RBV

Even though the RBV has become one of the most cited and implemented theories in the history of management research (Spina et al. 2013), the theory has recently received critique due to its limited applicability and static nature, which similarly accounts for its lack of explanation regarding what a 'sustained' competitive advantage actually is. Kraaijenbrink et al. (2010) summarise common critiques of RBV as the following:

1. RBV lacks managerial implications (Priem and Butler 2001, Lado et al. 2006) and has limited applicability (Connor 2002, Gibbert 2006a, Gibbert 2006b)
2. RBV implies infinitive regress (Collis 1994, Priem and Butler 2001)
3. A sustained competitive advantage cannot be achieved (Eisenhardt and Martin 2000, Fiol 2001)
4. RBV is not a theory of the firm (Foss 1996a, Foss 1996b)
5. VRIO is not sufficient and lacks of empirical support for a SCA (Armstrong and Shimizu 2007, Newbert 2007)

¹² Note that VRIO is also referred to as VRIN. Non-substitutability, a critical attribute of a resource, implies that the resource is 'organisational'. Hence, the resource can only be exploited *within* the focal organisation.

6. The definition and characteristics of resources are not made clear enough (Priem and Butler 2001)

In sum, the offered critiques cannot be dismissed and call for a further theorisation of RBV and its empirical applications. In response, this thesis aims to elaborate on the discussed assumptions and constructs of RBV in the context of service provision.

The theoretical limitations of RBV to practice that only bundled resources or assets can create competitive advantage, the ‘extended’ resource-based view (ERBV) has developed. This theoretical extension assumes that competitive advantage lies beyond a firm’s boundaries and refer to the relational or capabilities (Dyer and Singh 1998) that ultimately result in collaborative quasi-rents (Madhok and Tallman 1998). From an ERBV perspective, these inter-organisational relationships (Ireland et al. 2002) do not emphasise on the ownership of valuable, rare, inimitable or non-substitutable resources, but rather focus on the development of competitive advantages through an ‘interplay between organisations and their external environment’ (Lewis et al. 2010, p.1035). However, ERBV does not serve as a fundamental basis for this thesis due to its explicit link to supply practices rather than the providers’ competitiveness.

2.5 Governance Mechanisms and Transaction Cost Economics

Over the last two decades, organisational research has aimed to explicate the variances of governance structures in a market and in response developed the theory of transaction cost economics (TCE) as a standardised framework (Williamson 1975, 1985). Rather than looking solely at the production function, as is typical of neo-classical theories, TCE “describes the firm as an efficiency-inducing administrative instrument that facilitates exchange between economic actors” (Leiblein 2003, p.939). Within the context of service providers, TCE describes the institutional conditions under which the outsourcing of specific activities should be conducted internally within a hierarchical setting or purchased externally in the market (Halldórsson and Skjøtt-Larsen 2006). As it pertains to a firm's boundary decisions, the transaction cost approach associates the making or buying of a product with the governance structure in any buyer-supplier relationship. Research on governance and inter-organisational relationships is, therefore, rooted in TCE and aims to identify the factors that influence the outsourcing decision for a specific activity.

The central purpose of TCE is to explain why some transitions or transactional relationships are better accomplished by using one institutional arrangement rather than by using other arrangements (Greenberg et al. 2008, p.594).

In this way, TCE purports to uncover the optimal governance structure in the marketplace, depending on the transaction costs. That is, organising a particular transaction either fully internally within a hierarchical setting (i.e. purely make) or fully externally as an exchange in the market (i.e. purely buy). In order to achieve the most efficient governance structure, TCE considers the costs that arise during the process of partner selection and the establishment of the contractual relationship, as well as those *ex-post* contractual costs that are incurred through controlling and monitoring of the outsourced processes.

The following sections of this literature review outline the development of TCE and explicate the underlying assumptions and factors that determine the application of the transaction cost approach to service provision and outsourcing relationships.

2.5.1 Background and Development of TCE

Based on the work of Ronald Coase (1937) the notion of economic organisations has sparked the development of economic theories more generally. Referring to his seminal essay, the market produces all goods and services most efficiently already. Consequently, because no firm can internalise these processes, it is always more efficient to buy from the market rather than produce the goods or services in-house. This then begs the question as to why firms exist at all.

According to Ronald Coase and Friedrich Hayek, the essential question about the existence of firms and markets is answered by the system itself. The economic system is organised by the price mechanism, not by society, and therefore works perfectly in itself (Hayek 1933). Both of their groundbreaking ideas conclude that there is no need for a central control that adjusts supply and demand or production and consumption, at least in the form of an organisation. However, decisions about the “direction of resources is dependent directly on the price mechanism” (Coase 1937, p.387). In order to determine the size of a firm, all costs have to be considered including marketing costs (i.e. costs using the price mechanism) and costs that are incurred through organising contracting or procurement processes. Subsequently, the production processes in terms of quantity and allocation of activities to different firms can be evaluated.

Coase's research emphasises transaction costs rather than pure production costs. He asserts "that under certain conditions, the costs of conducting economic exchange in a market may exceed the costs of organising the exchange within a firm and refers to the costs as 'costs of running the system'" (Rindfleisch and Heide 1997, p.31), which comprise costs of negotiating contracts (*ex-ante*) and monitoring the performance (*ex-post*). 'Organising' governance structures includes the costs associated with searching for information about relevant prices (since information about perfect pricing is neither readily available nor fully accessible in a real world¹³) as well as those costs incurred via negotiating and contracting exchange transactions. The number of transactions and the distribution of resources that are 'organised' by the price mechanism thus constitute firms. Coase (1937, p.395) summarises why there is more than one dominant firm carrying out all production processes in any marketplace:

The point has been made [...] that a firm will tend to expand until the costs of organising an extra transaction within the firm become equal to the costs of carrying out the same transaction by means of an exchange on the open market or the costs of organising in another firm. But if the firm stops its expansion at a point below the costs of marketing in the open market and at a point equal to the costs of organising in another firm, in most cases (excluding the case of "combination"), this will imply that there is a *market transaction* between these *two producers*, each of whom could organise it at less than the actual marketing costs. [Emphasis added]

Williamson (1981) builds on the work by Coase and further explicates the limited applicability of neo-classical theories to the firm in organisational research. Economic approaches to maximising the production function do not acknowledge the importance of inter-organisational relationships. TCE logic (Williamson 1975), however, addresses the transactions rather than the commodities and adopts governance structures as the central unit of analysis. Williamson (1981, p.549) identifies 'transactions' as the transference of goods and services and focuses on achieving efficiency by applying the transaction cost approach to organisations at three levels of analysis:

The first is the overall structure of the enterprise. This takes the scope of the enterprise as given and asks how the operating parts should be related one to another. [...] *The second or middle level* focuses on the operating parts and asks which activities should be performed within the firm,

¹³ This also highlights the opposite view from neo-classical *perfect* market conditions.

which outside it, and why [...]. *The third level* of analysis is concerned with the manner in which human assets are organized. The object here is to match internal governance structures with the attributes of work groups in a discriminating way. [Emphasis added]

Following this approach to structuring and organising transactions in a marketplace, Williamson develops (and introduces) three types of governance forms: ‘market’, ‘hierarchy’ and ‘hybrid’. The distinctions become relevant in the later analysis of the presented case studies and contribute the development of the contextual framework proposed in this thesis.

Greenberg et al. (2008) define ‘markets’ in terms of a competitive environment, which is given by perfect information about homogeneous products and resource mobility. ‘Hierarchies’ are defined as those vertical integrations, established in a bureaucratic environment. And lastly, all other arrangements, such as joint ventures, supply chain networks or collaborations between firms are classified as ‘hybrids’. The individual form or structure of an inter-organisational arrangement is determined by the amount of transaction costs as outlined by Krzeminska (2008). She equates a high degree (i.e. amount) of transaction cost variables to a hierarchical arrangement such as vertical integration. Low level of transaction cost variables represents an exchange in the market such as pure outsourcing. Frequently repeated transactions characterise a hybrid form of governance, which is found in co-operations between two or more firms. An overview of the general assumptions and characteristics of TCE theory is summarised in Table 2.4.

TCE	Description
<i>Key Idea</i>	Explains why firms exist and exchange goods or products in the market Choice on governance structure (market, hierarchy or hybrid)
<i>Unit of Analysis</i>	Efficient governance structure 3PL services Transaction costs, logistics performance
<i>Nature of Relations</i>	Focus on transaction-based attributes such as asset specificity Cost efficiency, short-term contracts
<i>Assumptions</i>	Bounded rationality Opportunism Risk neutrality
<i>Problem</i>	Efficient governance structure Which activities should be outsourced to 3PL providers
<i>Time Dimension</i>	Static

Table 2.4: Overview of Transaction Cost Economics

Source: Adapted from Halldorsson et al. (2007).

2.5.2 TCE Assumptions

What we learn from Coase and Williamson is that relationships and governance structures are determined by costs, related to transactions between several firms that occur whenever an exchange of goods or services in a market takes place. Certain assumptions about human behaviour, however, affect the conditions under which these transaction costs occur. The remainder of this section evaluates the assumptions of ‘bounded rationality’, ‘opportunism’ and ‘risk neutrality’ in the context of service provision and systems integration capabilities. Organisations strive to evaluate the trade-off costs between gaining relevant information in order to overcome these assumptions and mitigating the risk of uncertainty in making an outsourcing decision.

Bounded Rationality

Theorising about the nature of human beings in terms of cognition leads to the axiom that each individual behaves in a certain and unique way. Decision makers in a management and business environment are bounded and limited in their rationality (Simon 1957, Williamson 2000). This concept refers to the limited ability of individuals within a firm to plan for the future, which is caused by the lack- or costly acquisition of information and therefore is a major obstacle (Kreps 1999, Verbeke 2003). Circumstances surrounding the contracting environment, such as the behaviour and performance of firms, limit the capability of predicting outcomes. An uncertain environment, in which the decision maker has no insight about a contracting partner's previous behaviour in market exchanges, hinders these cognitive capabilities. Rindfleisch and Heide (1997) relate environmental and behavioural uncertainty to the *ex-ante* and *ex-post* specification of outsourcing contracts, respectively. The contractual agreement is also impacted inasmuch as firms must respond and adapt (i.e. in terms of behaviour and performance) to these changing circumstances. For complex service provision, for instance, the contract often needs to be re-written or modified during the ongoing outsourcing process, as requirements change due to individual outcomes, as is outlined by Leiblein (2003, p.940):

In spite of their best efforts to deal with the complexity and unpredictability of the world around them, [individuals] are limited in their ability to plan for the future and to accurately predict and plan for the various contingencies that may arise. As a result, it is costly, both in time and resources, for individuals to acquire and interpret information about the contracting environment and the firm.

Bounded rationality is, therefore, grounded in performance evaluation issues, since it is difficult to measure the outcome of a relationship in advance. These limitations (bounded rationality), however, are primarily mediated by the absence of (expensive) information that is costly to acquire *ex-ante*. Consequently, ongoing negotiations about contractual specifications incur transaction costs that occur due to antecedent assumptions, such as pricing information or supplier availability. Conner and Prahalad (1996, p.482) point out “that no two individuals possess identical stocks of knowledge, because cognitive limitations prohibit one person [...] from absorbing the entire accumulated knowledge and skills of another [...] and vice versa”. The focus, therefore, lies in gaining the *relevant* information, especially given the environmental uncertainty integral in a complex (business) system. The assumption of bounded rationality, therefore, applies to the decision maker, as their judgement is based on human behaviour and cognition.

Opportunism

Another behavioural assumption in the TCE framework is opportunism, which according to Leiblein (2003, p.940) refers to the behaviour of individuals that are “self-interest[ed], seeking with guile (Williamson 1975) or subject to frailties of motive (Simon 1982)”. Even though some scholars might see opportunism as a deterrent for governance theory (e.g. Conner and Prahalad 1996), Williamson (1985) argues that it is impossible for firms to exist without the underlying assumption of self-interest, in which each individual or firm seeks to maximise its own profit. However, opportunism does not necessarily mirror cognitive human nature and, therefore, its applicability to models of institutional theories is doubtful (Krzeminska 2008). Researchers argue that opportunistic behaviour is removed from the market automatically, as a consequence of the competitive environment. For example, Hill (1990, p.500) asserts that “in the long run, the invisible hand deletes actors whose behaviours are habitually opportunistic. Consequently, [...] the risk of opportunism will be low”. Opportunism, nevertheless, accounts for transaction costs in terms of contract negotiations. The partner firm’s risk perception and opportunism play important roles in the *ex-ante* bargaining phase. Krzeminska (2008) argues that opportunism is the basis of all transaction cost conflicts and can be reduced in hierarchical systems, such as vertical integration, for instance. Hill (1990, p.501) justifies this proposition, when he claimed that the “selection of [...] actors leads to the conclusion that the transaction cost rationale for vertical integration has been overstated”.

In sum, self-interested managers tend to base their outsourcing choices, with regard to selecting a supplier for products or services, on maximising the firm's profit. However, this is highly dependent on the attitude towards risk, i.e. risk-seeking firms (Chiles and McMackin 1996) and therefore deserves serious consideration.

Risk Neutrality

Williamson (1985) states, that following a TCE logic, the perception of risk is equally distributed amongst firms. Individual risk propensity (i.e. risk aversion or taking) is not a reasonable explanation for the willingness to bear risks in outsourcing decisions. Krzeminska (2008, p.34) furthers this assumption and cautions that risk preferences must not necessarily be taken into account for outsourcing decisions for the following reasons:

Assuming risk aversion or risk taking as equally distributed across decision makers is just as unduly simplifying as is the assumption of risk neutrality. Hence, individual risk preferences would have to be modelled in order to overcome this limitation [...]. Differing individual risk preferences are not expected to explain [outsourcing], because the decision to simultaneously make and buy is made by one decision maker or as an agreement of a group of decision makers in one firm. Hence, inter-individual differences in risk preferences are not able to explain make-and-buy, since the differences would have to be intra-individual which seems not very plausible.

Even though individuals have different propensities towards risk, in any empirical evaluation, the decision maker represents only one firm and thus presumably one equal risk preference¹⁴. Figure 2.5 summarizes the different behavioural assumptions of TCE theory that are also represented in service relationships.

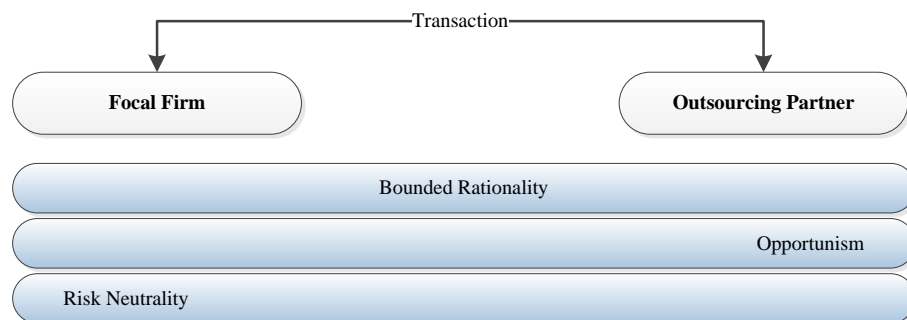


Figure 2.5: Behavioural Assumptions in TCE

Source: Adapted from Krzeminska (2008).

¹⁴ Note that this generalisation of risk preferences is adopted in the later analysis of the cases in this thesis.

Both the firm and outsourcing partner are affected by bounded rationality as this assumption applies to every individual person or firm at all times. In the context of a governance structure, however, opportunism is akin to the selection of an outsourcing partner or service provider. Risk neutrality, alternatively, only affects the focal firm and its initial outsourcing decisions.

2.5.3 TCE Dimensions on Service Provision and Outsourcing

The previous section outlined the underlying behavioural assumptions in uncertain environments that impact the choice of the optimal governance structure in outsourcing relationships. In addition to these assumptions, a multitude of other variables affects the governance form, insofar as they are said to be predictive and influential in the theorised relationship. Referring to TCE theory, and particularly Oliver Williamson's version of TCE that comes closest to "business decision makers" (Ghoshal and Moran 1996, p.16), the associated costs increase when transactions are characterised by high 'asset specificity', high 'uncertainty', 'small numbers bargaining' and high 'frequency'.

Asset Specificity of Transactions

The transaction cost approach views 'asset specificity' as the main determinant in conceptualising relationships in terms of choosing the optimal governance form (Williamson 1985). "Asset specificity refers to the level of customisation associated with the transaction" (McIvor 2009, p.47). The specification of assets that can also be referred to as the specific investment in a particular transaction (Williamson 1981), is an important characteristic in TCE, as it describes the value of utilising certain assets outside a transaction. Asset specificity interprets a loss of value by employing an asset to other transactions, which results in quasi-rents (Williamson 1991, Vandaele et al. 2007). The quasi-rent approach assumes that the value of an asset or factor is higher in its best use than the value in its second-best use. Generally speaking, the higher the asset-specific investments, i.e. best use, the lower the value outside the transaction, i.e. second-best use, and vice versa. Every exchange in a market requires these kinds of transaction specific investments in order to gain quasi-rents (Klein et al. 1978), which occur in the form of physical customisation, human assets, such as specialised knowledge or site specificity in terms of location. Empirical studies have tested the effect of asset specific investments on outsourcing or make-or-buy strategies. While two exemplary studies support the positive correlation between asset specificity and knowledge on the choice of governance

form (Dutta et al. 1995, Lee and Lim 2001), other studies deny a positive effect of asset specificity on outsourcing decisions (McNaughton 2002, Parmigiani 2007).

Dutta et al. (1995) identified a positive correlation, in the context of the mortgage market, of specific investments into physical assets on competition as a safeguard by establishing house accounts. The authors show, by combining industry data with lab experiments, that firms benefit from obtaining licences, insofar as their competitors need to make larger expenditures in order to overcome price hikes. Lee and Lim (2001) investigate human assets in a longitudinal study of outsourcing decisions. They found that the higher the level of education (amongst human personnel), the more likely a firm will choose a strategic outsourcing strategy. Alternatively, low levels of education imply the buying of goods and services in a market exchange. In contrast to the positive correlation identified between asset specificity and outsourcing strategies, McNaughton (2002) and Parmigiani (2007) found a negative one and argue that greater asset specificity leads to insourcing rather than strategic outsourcing. According to Leiblein and Miller (2003, p.841), the “set of transactional attributes [proposes] which activities to execute internally and which activities to outsource”. Consequently, the level of asset specificity as a variable in the outsourcing framework prescribes whether to conduct a market, hierarchy or hybrid governance form.

For instance, transactions with high asset investments call for a hierarchical structure, as there is no need to include an external partner due to the assumption of opportunism (Krzeminska 2008). Any external partner would increase the risk of opportunistic behaviour, because the higher the investment, the higher the self-interest, with regard to profit. Vice versa, a low asset investment recommends the market governance form as the optimal choice. In this instance, organisations attempt to rid themselves of any internalisation, as it is much easier and cheaper to purchase low specific functions on the market. Simple transportation services, for instance, would count as transactions with low specificity in terms of physical assets and knowledge. Hence, these functions are usually contracted out on a short-term basis or as daily ad-hoc arrangements on the spot market that result in ‘arm’s-length’ relationships¹⁵. However, the design of complex distribution

¹⁵ In the further analysis of different types of service provision, these spot market transactions play a crucial role and are found to be common amongst standard outsourcing activities.

networks or large-scale projects requires a high degree of knowledge and specialised assets, which cannot simply be purchased occasionally, but require long-term contracts, thus establishing a hierarchical structure. These assumptions later contribute to the development of the theoretical constructs and conceptual framework.

Figure 2.6 shows the assumed and predicted relation between the transaction costs and the level of asset specificity. Three different governance structures are illustrated, where the polar types are presented as the market function $m(k)$ and the hierarchy function $h(k)$. A combination of both represents the hybrid function $x(k)$.

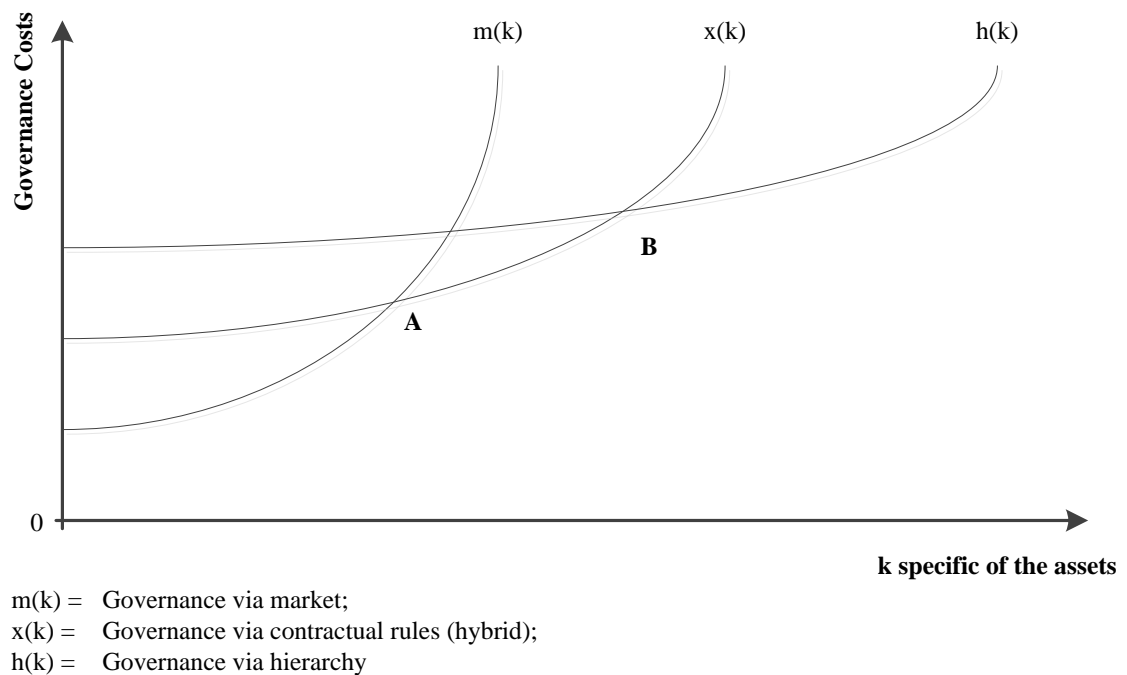


Figure 2.6: Governance Costs related to Asset Specificity

Source: Adopted from Krzeminska (2008) and modified from Williamson (1975).

As demonstrated in Figure 2.6 “the higher the asset specificity involved, the higher the costs of its market monitoring” (Silva and Saes 2007, p.449). The intersections of the cost functions indicate the points where the structure should be altered from a market mode towards a hybrid mode (A) and from a hybrid mode towards a hierarchical mode (B). The level of asset specificity finally determines the structure of the governance form. A high level of asset-specific investments recommends a hierarchical form as the most efficient institutional arrangement. When asset specificity and the incurred investments are low, an exchange in the market (e.g. spot market transactions) is the best fit. Krzeminska

(2008), however, criticises this perspective of asset specificity, as is further discussed in section 2.5.4.

Williamson (1985) explains the relationship between production and transaction costs as they pertain to asset specificity, as is illustrated in Figure 2.7. The diagram presents the total cost function ($\Delta PC + \Delta TC$) as the difference between production costs ΔPC and transaction costs ΔTC (i.e. the cost differences between the costs for the buyer and the supplier of goods or services), and indicates whether a firm favours outsourcing (area above the x-axis) or prefers to retain in-house control via a hierarchical outsourcing setting (area below x-axis).

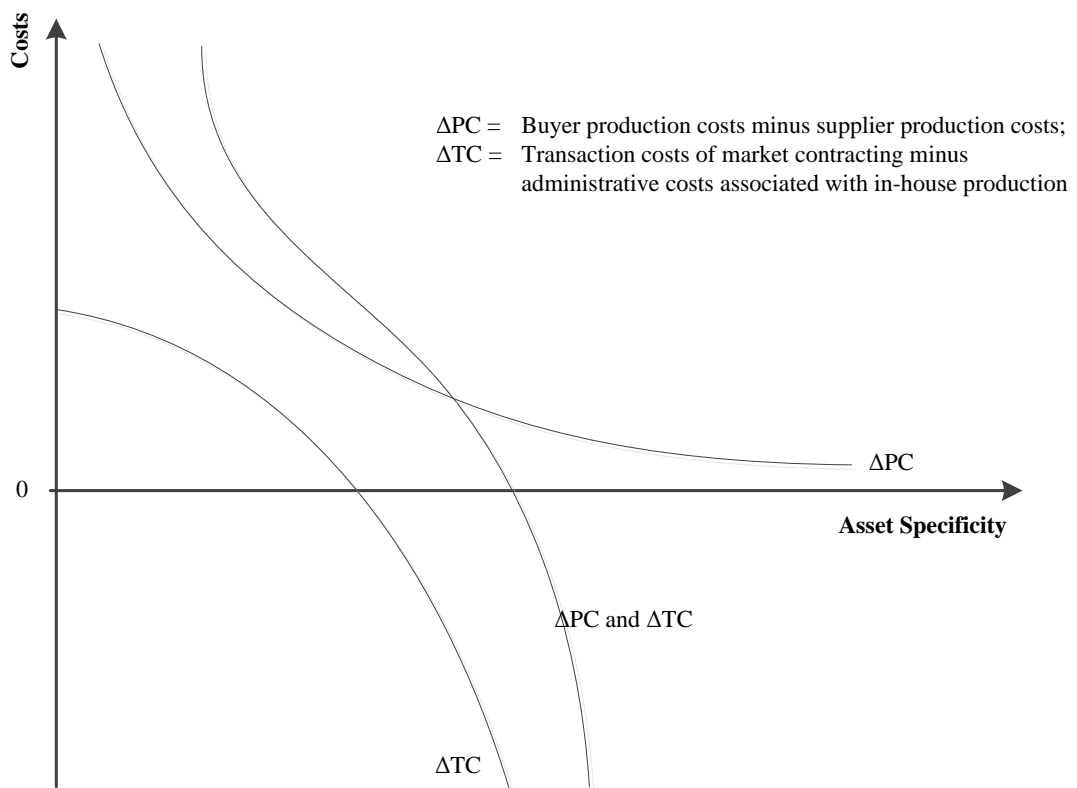


Figure 2.7: Transaction and Production Costs related to Asset Specificity

Source: Adopted from Krzeminska (2008) and modified from Williamson (1981, 1985).

The diagram outlines that the production cost differential ΔPC for low asset specific transactions always favours suppliers, due to economies of scale and the difference between buying and supplying will therefore only converge towards zero costs. This implies that a buyer can never produce cheaper than a supplier. However, the transaction cost differential ΔTC , i.e. the difference between the costs of internal administration and contracting in the market, indicates a relatively early point (A) where it is favourable for

the buyer to begin in-house production. The sum of both differential functions indicates the trade-off between making and buying, where point A “represents a theoretical value of asset specificity, [...] where the favourability of one governance form reverses to the other” (Krzeminska 2008, p.41). Hence, the governance form shifts from market to hierarchy for values of asset specificity above A, and vice versa.

In sum, higher asset specificity for any given transaction favours a hierarchical governance structure, where production of goods or services are performed in-house, assuming a constant, albeit moderate level of uncertainty.

Uncertainty of Transactions

The transaction cost approach differentiates between two types of uncertainties, namely behavioural and environmental uncertainty (Krzeminska 2008). The main distinction between these two types is their relation towards opportunism. Behavioural uncertainty refers to the opportunistic behaviour of individuals and is assumed strategic in nature. Environmental uncertainty, however, is not related to opportunism and is therefore perceived as non-strategic. Koopmans (1991) divides environmental uncertainty into two types, namely primary uncertainty (i.e. a lack of knowledge about certain natures) and secondary uncertainty (i.e. a lack of knowledge about other actors in the economy, such as customers, suppliers and competitors).

‘Behavioural uncertainty’ is widely accepted as the fundamental type of uncertainty in TCE, as it represents the risk of opportunistic behaviour and contributes to the determination of transaction costs, as was previously discussed. The underlying motivations for opportunism stem from information asymmetry and goal incongruences. Heide (2003, p.25) found that problems of information asymmetry, namely ‘moral hazard’ and ‘adverse selection’¹⁶ can be overcome by “enabling the market relationship to be structured along hierarchical lines”. Heide emphasises that research should focus on relationships rather than contractual dyads.

The choice of the governance structure based on the behavioural assumptions and the degree of asset specificity is illustrated in Figure 2.8. Here, environmental uncertainty is

¹⁶ Note that the concepts of moral hazard and adverse selection are further evaluated in subsection 2.6.1 in line with the assumptions of agency theory.

not considered at all, as it lacks of empirical findings, which is further discussed below. TCE examines the most efficient governance mode considering the level of behavioural uncertainty and asset specificity.

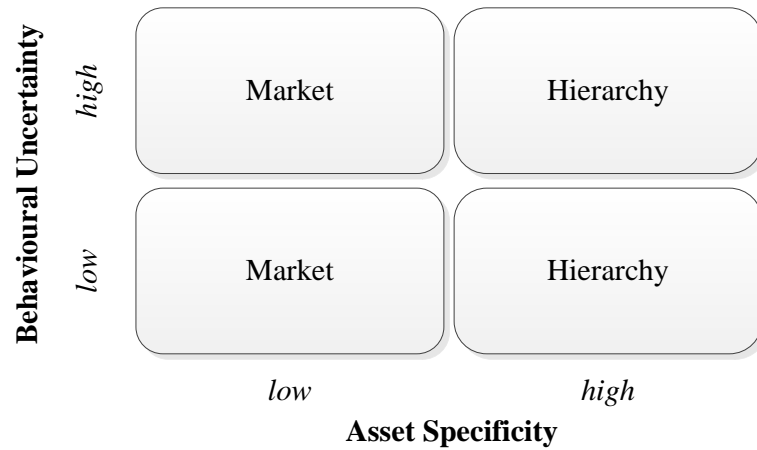


Figure 2.8: Choice of Governance Mode based on TCE

Source: Adapted from Krzeminska (2008).

Following these theoretical assumptions, TCE stipulates that when asset specificity is high, a hierarchical governance form is optimal, whereas when the specificity is low, a form of market exchange is recommended. The impact of uncertainty on the evaluation of these governance forms, however, is very little and according to Williamson (1985, p.59), “behavioural uncertainty is irrelevant”. Williamson supports his argument by ascribing little value to the factor of behavioural uncertainty, as it mostly depends on the environment. As illustrated in Figure 2.8, asset specificity is more crucial than behavioural uncertainty, but is nonetheless a significant condition in TCE, as a result of opportunism. This paradoxical view towards behavioural uncertainty and its purported insignificance to the choice of the governance form can be clarified by arguing that behavioural uncertainty is a necessary condition, without which asset specificity becomes meaningless insofar as it implies opportunism. In conclusion, the influence of behavioural uncertainty should not be overlooked, as the level of asset specificity determines it.

The impact of ‘environmental uncertainty’ on governance forms has not been supported empirically, as there are many different influencing factors, such as demand and volume uncertainty, technological uncertainty, volatility and ambiguity (Krzeminska 2008). Changes in the environment, such as new technologies that support production processes and knowledge transfer in the supply chain “requires greater resource commitments” (Holcomb and Hitt 2007, p.472), which suggests firms might benefit from pursuing

strategic outsourcing. Technological innovations, for instance, grant supplier firms high bargaining power and entail (again) to the risks associated with opportunistic behaviour. Consequently, internalisation through a hierarchical structure will overcome this risk.

In sum, these external factors separately or in combination certainly influence the degree of opportunism, risk neutrality and bounded rationality, and therefore impact the competitiveness of individual organisations. Generally, a hierarchical structure can compensate the changing environment more efficiently than an exchange of transactions in the market. As will be evidenced in the later analysis of the cases in this thesis, a benefit of organising various transactions in a hierarchical manner is also supported. Moreover, this relates to the environmental uncertainties, and in particular, to the rapidly changing markets that are adopted by the hierarchical integration of service provision. Hence, changing market conditions, caused by external uncertainties, lead to costly re-negotiations / adaptations, when transactions are organised as an exchange in the market.

Small Numbers Bargaining for Transactions

‘Small numbers bargaining’ gives a strong correlation between opportunistic behaviour and market inefficiencies with regard to the transaction cost approach. Small numbers here refers to an uncertain environment, where there are only few alternative options for a buyer or a seller to replace each other in a transaction, e.g. there are barely any switching options available for either side (Johanson and Mattsson 1987, Peng and Heath 1996). Costs hereby include those incurred by negotiation and monitoring processes in terms of switching costs. Higher costs for switching a provider, for instance, occur when the number of specialised firms that are suitable for the outsourced transaction is limited (Klein et al. 1978, Williamson 1981). Holcomb and Hitt (2007, p.471) define bargaining power as “the ability to influence the outcomes of negotiated relations”. The negotiation outcome in outsourcing relationships is affected by the number of available partners in the marketplace. The higher the bargaining power, the better the outcomes for the individual firm, and vice versa. The likelihood of opportunistic behaviour, therefore, is linked to the bargaining power of a specialised firm. In other words, small numbers bargaining can influence the decision of outsourcing when there are few specialised firms in the marketplace. Possible disadvantages, such as reduced negotiation power and potentially high levels of opportunism for the outsourcing partner, lead to a less satisfactory outsourcing arrangement. Regarding transactions, specialised firms may not

be willing to share any relevant information on their production processes or requirements, for instance. As a result, the transaction costs for the focal firm will increase (Walker and Weber 1984). However, if the number of specialised firms increases in the market, competition increases and collaborative partners are more likely to adjust their production and share information without leveraging the costs (Walker and Weber 1984). Consequently, transaction costs will be reduced due to less opportunistic behaviour, and the likelihood of outsourcing will increase. As Holcomb and Hitt (2007) propose, there is a positive correlation between the (large) number of specialised firms and the likelihood of pursuing strategic outsourcing.

Frequency of Transactions

Another determinant of costs in TCE is the ‘frequency’ of transactions, which has not received much attention in empirical research (Rindfleisch and Heide 1997). Williamson (1985) refers to frequency as the cost savings that can be gained through economies of scale and scope. In addition, the costs associated with controlling and monitoring activities are reduced when the occurrence of transactions is predictable over a period of time, which also results in a decrease of uncertainty. Therefore, “frequent transaction[s] are more efficiently organized inside the firm's hierarchy” (Krzeminska 2008, p.54). However, high expected frequency of transactions may also reduce the coordination costs with regard to changing suppliers. Repetition of transactions, for instance, increases the bargaining power for the focal firm, which therefore benefits from an exchange in the market. Thus, there are clearly conflicting benefits to consider when frequency is utilised as a determinant for selecting the optimal governance form.

2.5.4 Critique of TCE

As is outlined above, frequency and environmental uncertainty have little impact on determining the optimal governance form. In addition, it has proved difficult to empirically test these correlations. Therefore, asset specificity and small numbers bargaining have received the most attention amongst scholars and practitioners, yet the viewpoints held towards these assumptions are not necessarily static. For example, Krzeminska (2008, p.66) argues against the appropriateness of asset specificity because “asset specificity can only lead to distinct institutional arrangements, which is either market when asset specificity is low or hierarchy when asset specificity is high and the two governance modes do exclude each other mutually”. She concludes that TCE logic,

in terms of asset specificity, is not as a useful tool for making outsourcing decisions, contrary to the majority of extant research (Ghoshal and Moran 1996).

2.6 Outsourcing Arrangements and Agency Theory

The focus of agency theory (AT) is based on incentives and the contract design, in order to overcome goal incongruences¹⁷ between different parties in a contractual relationship. Its theoretical origin stems from the longstanding debate about the separation of ownership and control (Berle and Means 1932) and property rights (Alchian and Demsetz 1972). Agency theory uses incentive structures in terms of outcome-based or behaviour-based contracts to solve the agency problem, which relates to the misalignment of goals between contractual partners (Shapiro 2005, Walls et al. 2012) and is therefore defined by certain assumptions according to different risk propensities of both buyers and suppliers of goods or services.

The following sections outline the development of AT and discuss the underlying assumptions that determine its application to service provision and outsourcing.

2.6.1 Background and Assumptions of AT

The evolution of agency theory (AT) in organisational and management research can be pointed back to the 1960s and early 1970s, as a result of an ongoing discussion about the separation of ownership and control amongst organisations (Berle and Means 1932). Economic analysis began to address issues of risk sharing, goal incongruences and organisational problems (Eisenhardt 1989a). According to Jensen and Meckling (1976), a collaborative relationship between two firms implies differing goals that are due to the firms' individual specialisation and division of labour, which highlights the focus on each firm's core competencies. Nonetheless, all parties aim to maximise their own profit in order to gain superior economic performance. Each cooperating party is autonomous in its ability and willingness to bear risks or making decisions and this is commonly referred to as the agency problem¹⁸. Fayezi et al. (2012) mention that issues of uncertainty require modern management forms that look beyond simple contractual relations. Originating in

¹⁷ Note that the concept of goal incongruences will be further explained in section 2.6.3 with regard to the principal-agent problem.

¹⁸ The phenomenon of the principal-agent problem is further discussed in section 2.6.3.

the work by Barry Mitnick (1973) and Stephen Ross (1973), AT broadens the literature about risk sharing and draws attention to the pervasive agency relationship in social sciences. Mitnick (2006, p.2) succinctly summarises the contribution of both authors to the economic and institutional theory of agency:

Ross introduced the study of agency in terms of problems of compensation contracting. Agency was seen, in essence, as an incentives problem. Mitnick introduced the now common insight that institutions form around agency, and evolve to deal with agency, in response to the essential imperfection of agency relationships.

Agency theory is generally applied to explicate financial constructs, such as compensation, acquisition and mergers, relationships, ownership structures, financial correlation and management innovation. Eisenhardt (1989a) first described the theory in an organisational context, which has facilitated an understanding of AT and its application to make-or-buy and outsourcing decisions from a governance perspective. Other scholars, such as Mitnick (1975), Jensen and Meckling (1976) and Ross (1979) have also contributed to the perspective of organisational relations involving the theory of the firm, which AT is a part of. Since then, AT has been used to explain economic relationships in various other disciplines, such as information systems, economics, finance, management, supply chain management and sociology, as listed in Table 2.5.

Discipline	Author	Description
<i>Information Systems</i>	Mahaney and Lederer (2003)	Examining the failure rate of project relationships in the development of information systems and used AT to understand information systems project outcomes.
<i>Economics and Finance</i>	Sappington (1991)	Describing the principal – agent relationship in an economic and financial environment by examining the impact of incentives on the motivation of agents.
<i>Management</i>	Eisenhardt (1985)	Evaluating behaviour-based or outcome-based control strategies for organisational design in terms of task programmability.
<i>Supply Chain Management</i>	Halldórsson and Skjøtt-Larsen (2006), Shook et al. (2009)	Purpose is to understand the inter-organisational dynamics in a buyer-supplier relationship for logistics service; focus on managing risk and aligning incentives.
<i>Sociology</i>	Shapiro (1987)	Discussion about the structure of personal relations; trust creates problems in socio-cultural settings.

Table 2.5: Application of Agency Theory in other Disciplines

Source: Adapted and derived from Fayezi et al. (2012).

Perhaps because the original application of AT can be identified amongst multiple disciplines, scholars disagree about what agency theory is and what exactly encompasses it. Jensen (1983) split the management literature into two streams by distinguishing between two different interpretations of AT with regard to markets. He identified those scholars, who promote the view that capital markets have a significant impact on the firm (e.g. Barney and Ouchi 1986) and those, who neglect to mention the capital markets at all (e.g. Anderson 1985, Eisenhardt 1985). Contrastingly, authors criticise the alleged advantages of applying AT to organisations, as is further discussed in section 2.6.4.

As it has been developed from the information economics literature¹⁹, which has been deemed most appropriately for this thesis given its context of service outsourcing, AT describes the relationship between one party (the principal), who delegates work in terms of control or decision making to another party (the agent) (Jensen and Meckling 1976, Fama and Jensen 1983). In his early and seminal essay about the economic theory of agency, Stephen Ross (1973, p.134) defines the agency relationship as one of the oldest and most common social interactions:

An agency relationship has arisen between two (or more) parties when one, designated as the agent, acts for, on behalf of, or as representative for the other, designated the principal, in a particular domain of decision problems. [...] Essentially all contractual arrangement, as between employer and employee or the state and the governed, for example, contain important elements of agency.

This particular type of an organising problem is the result of a collaborative relationship between two (or more) parties, in which each one pursues different goals and objectives (Eisenhardt 1988). Keeley (1980) promotes the contract metaphor as the central unit of analysis from which to explain the governance relationship between the principal and the agent. Hence, determining the most efficient contract to describe the relationship between two (or more) parties is central to studies incorporating AT. Furthermore, the costs that arise through structuring, monitoring and bonding these governance contracts, namely agency costs, must not exceed the benefits gained through the contractual relationship (Fama and Jensen 1983). The nature of the contract is based on either the behaviour or the outcome, in terms of the agent's performance. In a hierarchical governance structure

¹⁹ See Marschak and Radner (1972), who discuss the relationship between information flows and monetary models.

this is understood in terms of a salary and under a market governance structure it is thought of in terms of commission (Eisenhardt 1989a). Taking into account different assumptions and factors, the most efficient contract aims to solve the agency problem and promotes the risk sharing amongst parties. Table 2.6 gives an overview of the key ideas and assumptions of agency theory.

AT	Description
<i>Key Idea</i>	Principal-agent relationship is reflected in the efficient organisation of information and risk-bearing costs
<i>Unit of Analysis</i>	Contract between principal and agent
<i>Nature of Relations</i>	Adversarial relations, contract influences outsourcing activities
<i>Assumptions</i>	Human nature (people and organisations are self-interested, rational and risk-averse) Information asymmetry (information can be seen as a purchasable resource) Organisations (goal conflicts amongst parties in a contractual relationship)
<i>Problem</i>	What is the most efficient contract? Relationship in which partners have different goals and risk propensities Control problem due to information asymmetry. Moral hazard and adverse selection
<i>Time Dimension</i>	Static

Table 2.6: Overview of Agency Theory

Source: Adapted from Eisenhardt (1988, 1989) and Halldorsson et al. (2007).

Agency theory can be applied to any dyadic relationship. Its application to organisational phenomena, across both a macro level and a micro level environment, is highlighted by Eisenhardt (1989a, p.59):

Overall, the domain of agency theory is relationships that mirror the basic agency structure of a principal and an agent who are engaged in cooperative behaviour, but have differing goals and differing attitudes towards risk.

For example, AT can be applied to any employment relationship by assessing the goals and ambition of employees and developing the appropriate incentives, in terms of rewards. Furthermore, compensation of executives, in particular, either follows a fixed salary or is based on incentives, such as bonuses or stock options based on individual performances, or is a combination of the two. In order to clarify, which incentives are the most appropriate for any given situation, AT underlies certain assumptions about the principal-agent problem, which are presented in section 2.6.3.

Considering the assumptions and challenges that appear in principal-agent relationships, scholars have followed two streams of agency theory, namely ‘positivist agency theory’

(PAT) and ‘principal agent research’ (Jensen 1983). Both approaches help to further understand the complexity of agency theory and its assumptions (Mitnick 2006). Specifically, the challenge of hidden information that results in moral hazard and adverse selection will be outlined in these two streams. Moral hazard and adverse selection also contribute, as was previously mentioned, to the analysis of the case studies in this thesis and serve as theoretical constructs, which help to explain the service provision boundaries and systems integration capabilities.

2.6.2 Agency Theory Research Streams

Nilakant and Rao (1994) discuss the two main theoretical branches of AT in the context of new institutional economics. ‘Positivist agency theory’ suggests that monitoring and control of ownership is a consequence of managers’ performance and incentive schemes, which is essentially an *ex-post* consideration of a contractual relationship. ‘Principal agent research’ assumes ownership allocation as given and focuses on designing the *ex-ante* contracts and information systems²⁰.

Positivist Agency Theory

‘Positivist agency theory’ (PAT) aims to describe and narrate governance structures in complex and real-world collaborative settings, rather than empirically test them. Following a less mathematical approach, the positivist research stream identifies situations, where goal incongruences between principals and agents occur (Eisenhardt 1989a). PAT puts forth a single framework to explain principal-agent relationships, specifically between owners and managers of organisations. Shapiro (2005, p.274) investigates this concept in the sociology literature and supports PAT’s explanation of how to manage business relationships more effectively:

This work [Shapiro 2005] links social structure to types of agency relations, and it demonstrates how different combinations of recruitment, monitoring, and sanctioning practices yield different administrative systems. This [...] is certainly a far cry from the abstract mathematical models of principal agent [research].

²⁰ *Ex-ante* contract relationship issues in the context of this thesis are interpreted as the planning and selection phase of outsourcing arrangements. Theories concerning *ex-post* institutions are represented in the research stream of transaction cost economics.

Shapiro (2005) argues that agency relationships in a sociological as well as in an economic perspective entail costs for both the principals and agents. Both parties are required to pay these costs and therefore 'perfect' agency is unlikely to happen in any collaborative relationship.

Furthermore, Fayezi et al. (2012) examine the lack of trust amongst firms and their unwillingness to share sensitive information and summarise the key points of PAT as:

- Understanding real world behaviour
- Understanding issues in the complexity of relationship dilemmas
- Explaining the non-rational behaviour of agents or principals

Three influential articles provide support for the positivist concept of principal-agent relationships, which are outlined by Eisenhardt (1989a):

1. Jensen and Meckling (1976) examine how managers with ownership of equity align their interests with those of their respective organisations in the context of the ownership structure of corporations
2. Fama (1980) evaluates how information systems efficiently monitor and control the performance of top executives with self-serving behaviour
3. Fama and Jensen (1983) also investigate the performance of top executives based on the information systems available for the stockholders by describing the role of director boards

This notion of monitoring and controlling management performance in situations where there exist conflicting goals was extended by Jensen (1984), who applies the PAT to the controversial practices of mergers and takeovers. In his study, he justifies the necessity of 'golden parachutes'²¹ and demonstrates the positive impact of takeovers and corporate raiding on shareholders. According to Eisenhardt (1989a, pp.59-60), PAT deals mostly with "describing the governance mechanisms that solve the agency problem [and] enriching economics by offering a more complex view of organisations."

²¹ Golden parachutes are also referred to as severance agreements and include large payments or compensations for executives or members of the managing board in the case of their dismissal during mergers and acquisitions.

Principal-Agent Research (Moral Hazard and Adverse Selection)

‘Principal-agent research’ is considered the classical approach to design empirical research in management studies with regard to contractual or relational arrangements. Principal-agent research can be applied to examine relationships between buyers and suppliers, employers and employees, insurers and insured or lawyers and clients, for example (Harris and Raviv 1978). Generally, considering all theoretical assumptions with regard to the principal-agent problem, *agency research* mathematically proves a deductive logic in order to indicate the most efficient contract design.

However, this type of abstract theory does not attract much attention amongst scholars, insofar as it lacks practical application (Fayezi et al. 2012). In addition, principal agent research strives for more generalisability than PAT due to its explicit focus on testable implications. Eisenhardt (1989a, p.60) points out the complementary nature of both theoretical streams:

Positivist theory identifies various contract alternatives, and *principal-agent* [research] indicates which contract is the most efficient under varying levels of outcome uncertainty, risk aversion, information, and other variables. [Emphasis added]

In order to determine the most efficient contract, assuming goal conflicts and information asymmetry between principals and agents and given different perspectives of risk aversions, a simple model for contract design focuses on either the outcome or behaviour of an agent’s performance. In terms of risk sharing, principals are generally more risk neutral due to their ability to diversify their investments, whereas agents tend to be more risk averse as they rely on employment by the principal. Selviaridis and Norrman (2014) also observe such willingness to bear financial risks within the context of service providers in the logistics industry. Demski and Feltham (1978) identify two cases of economic settings focusing on the employment contracts that have been deemed most appropriate for service provision.

The first case is when information is complete and perfect in a market setting and the principal is fully aware of the agent's performance and the services delivered. In this case, a behaviour-based contract would be most effective since the risk-neutral principal can reward the agent with a fixed salary, compensation or a combination of the two (Ng et al. 2009, Ng and Nudurupati 2010). Applying an outcome-based contract would entail that

risk be unnecessarily transferred to the agent. Assuming the agent is more risk averse, this type of the contract is not the most appropriate option (Eisenhardt 1989a). Complete information therefore favours a behaviour-based contract.

The second case builds on the assumption that the principal is not fully aware of the agent's performance and cannot exactly identify what the agent is doing or has done. Two concepts, namely 'hidden information' and 'hidden action' are distinguished in the literature and "have been specifically developed to assist in designing an appropriate contract" (Fayezi et al. 2012, p.557). Hart and Holmström (1987) were amongst the first to address and differentiate the idiosyncrasies of hidden information and hidden action. They recognise that there exist two types of problems, which are inevitable in designing a contract. The literature commonly refers to these problems as 'adverse selection' and 'moral hazard', respectively. Pre-contractual issues are addressed in the phenomenon of adverse selection, while the phenomenon of moral hazard refers to post-contractual issues (Arrow 1985, Bergen et al. 1992).

Notably, both concepts contribute to the development of the theoretical constructs as part of the initial conceptual framework in this thesis that serves as the basis for the later analysis of the cases in order to define service provision boundaries.

'Adverse selection' entails the decision of selecting the appropriate agent as a partner *ex-ante*. These associated pre-contractual issues are known as the misrepresentation of ability by the agent and imply that the skills or abilities of an agent can never be completely known, judged or verified by a principal, neither before nor during the contractual relationship. For example, a supplier firm or service provider can claim to have an advanced level of expertise in a certain area, but whether this is true or not is debatable and not fully known. The contract design, considering adverse selection, must allow factors that motivate the agent to take actions in presenting his or her capabilities. Bergen et al. (1992) proposed three ways for how a principal can successfully evaluate an agent's characteristics and therefore overcome the problem of adverse selection. They suggest (1) screening (i.e. gathering information), (2) signalling (i.e. agent's action signalling) and (3) providing opportunities for self-selection (i.e. training programmes to signal interest). Following these three steps allows a principal to gather useful and tangible information that promotes the selection of an agent before entering into a contractual relationship.

Post-contractual issues involve an agent's lack of effort in the contractual relationship *ex-post*. 'Moral hazard' occurs whenever it is difficult to monitor or observe an agent's performance. Holmstrom and Milgrom (1987) suggest the implementation of appropriate compensation models to motivate agents and therefore mitigate the moral hazard problem. In situations where principal-agent relationships encompass a high complexity of processes and actions, the principal is exposed to greater risks (Fayezi et al. 2012). Hence, the agent, despite being motivated by self-interest, is more informed than the principal. One characteristic, for instance, is evident in the amount of effort or costs the agent has expended in delivering the agreed upon actions or services (Bergen et al. 1992). Different levels of knowledge and information held between the agent and the principal, therefore, determine a principal-agent relationship.

Both determinants, adverse selection and moral hazard, seem to be characteristics that are controlled by the agent, but also imply the principal. This condition is fundamental to this thesis and serves as the basis of the later analysis from a service provider's perspective, wherein the service provider acts as an agent in any type of outsourcing relationship. In order to motivate and incentivise an agent to undertake preferred actions, Bergen et al. (1992, p.3) suggest the following acting for the principal:

First, the principal might collect more information about the agent's behaviour by investing in monitoring activities and systems, and could then write a contract that bases the agent's rewards on information about his or her behaviour. [Emphasis added].

Behaviour-based contracts implement monitor systems, such as reports, observations and periodic reviews of the agent and tend to encompass fixed salaries or rates. However, the very costly monitoring systems only justify this reward contract if the information asymmetries are subject to well-defined behaviour. Sales jobs, for instance, where outcomes include customer relations, cannot be measured easily and show a low programmability in terms of formal definition of the required behaviour (Eisenhardt 1988). In cases where contracted services and activities show a low programmability, but expected behaviour is well defined and can be measured easily, Bergen et al. (1992, p.4) suggest the following:

Alternatively, the principal might write a contract that evaluates and rewards the agent on the basis of realized outcomes, but one that includes incentives appropriate to motivate the agent to pursue outcomes compatible with the principal's goals.

Outcome-based contracts, in contrast, determine an agent's rewards in terms of their performed outcomes, such as production or sales volume. The relevant activities are those that are easy to evaluate and show a high degree of programmability. For example, in retail firms, cashiering jobs mainly consist of simple tasks and operations that entail fairly straightforward behaviours, which can easily be measured, such as punctuality (Eisenhardt 1988, Ng and Nudurupati 2010).

2.6.3 *The Principal-Agent Problem*

Agency theory covers two problems, namely the agency problem and the problem of risk sharing (Eisenhardt 1989a). Whenever the agent is performing on behalf of or for the principal, both parties insist upon their own self-interest. As a result, the principal seeks to minimise agency costs, which include controlling and monitoring the agent's behaviour. The agent, however, wants to maximise its own benefits and endeavours to restrict the principal's control as much as possible. Fleisher (1991) identifies the efficient management of these problems, specifically by focusing on communication, conflict of interest, moral hazard and adverse selection as imperative to the agency problematic.

Eisenhardt (1988, p.492) distinguishes two key scenarios where the principal either knows or does not know how the agent has performed. She suggests that principals must, in either case, endure a risk trade-off:

In agency theory, uncertainty is viewed [...] in terms of risk-reward trade-offs and not just as a hindrance to planning. [...] Agency theory emphasizes the degree to which contracting issues such as compensation depend on a trade-off between the costs of *evaluating behaviour* and the costs of *bearing risk*. [Emphasis added]

Certain assumptions underlie the principal-agent problem and determine the most efficient contract in the governing relationship. Figure 2.9 illustrates the dyadic contract relationship phenomenon, highlighting the determinants of relationship building as (1) human nature (i.e. self-interest, bounded rationality and risk aversion), (2) information (i.e. communication and information systems) and (3) organisations (i.e. goal conflicts) (Eisenhardt 1989a). The principal-agent relationship, managed via a contract, is characterised by and entails these three assumptions (determinants) and influence both the nature and the outcome of the contractual relationship (Zsidisin and Ellram 2003).

In an attempt to interact with these assumptions, the specific contract for a project or complex outsourcing service can be modified according to the presence and emphasis of each variable. Consequently, a contract is designed following either an outcome-based or a behaviour-based measurement technique (Kim et al. 2007, Ng et al. 2009).

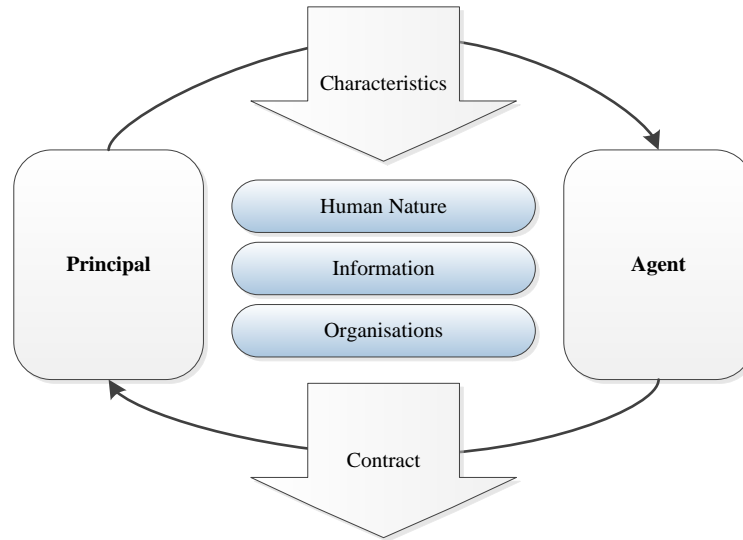


Figure 2.9: Dyadic Principal-Agent Relationship Assumptions

Source: Adapted from Eisenhardt (1989a).

‘Human nature’ as it relates to the behaviour of people or organisations underscores the tendency of self-interest. The fact that each party in a contractual relationship will behave in its best interest causes a mismatch of preferences²². These conflicts are grounded in the limited ability of individuals within a firm to manage complex contractual relations; this is colloquially understood as bounded rationality. Agency costs arise due to the frequency of these conflicts (Wright et al. 2001). Beside self-interest and bounded rationality, differences with regard to risk aversion complicate the efficient management of the agency problem. Different propensities towards risk contribute to conflicting goals and preferences in the relationship (Tate et al. 2010).

From an AT perspective, ‘information’ is seen as a resource that can be purchased (Eisenhardt 1989a). The problem of insufficient communication and poor information systems also results in goal incongruences. If information is hidden and thus not accessible to all parties in the relationship, misaligned interests are created. Asymmetric information about pricing, performance and contract compliances increase the costs of

²² Note that human nature refers to the similar assumption of opportunism in TCE theory.

monitoring an agent's behaviour. Agency theory is interested in minimising these costs and therefore reducing the risk of opportunistic behaviour (Zsidisin and Ellram 2003, Fayezi et al. 2012). Principals may use information about agents or suppliers to improve their relationships and build a general overview of their entire project(s) that spans beyond the functional boundaries of the firm²³. Tate et al. (2010) corroborate this view and argue that the type and function of information may differ for each principal depending on their organisational structure. However, the cost reduction due to an increase of transparency will ultimately improve a firm's profitability.

'Organisations' refer to goal conflicts amongst the parties involved that render contracts disadvantageous, since both parties are faced with higher agency costs. The agents want to be rewarded sufficiently for their work performance, however, the principal's main concern is that the agents deliver expected and pre-defined services in a timely manner whilst still meeting the required service levels (Tate et al. 2010). Efficient monitoring of performance in complex services is not always guaranteed due to a lack of proper metrics and measurement indicators, which can cause disparities in expected outcomes of certain contractual relationships (Logan 2000). This is similarly verified by the findings in this research, where highly integrated service provision does not allow for a proper measurement system. Complex services or projects cannot be measured easily, which might increase the agency related costs for both the principal in terms of not meeting service levels, and the agent in terms of not getting paid in full for the provided service. Requested and delivered performance criteria must incorporate both parties' perceptions of the contract (Poppo and Zenger 1998).

In sum, agency theory features similarities with the theory of transaction cost economics. However, each theory differs with regard to the unit of analysis and the different assessments of costs (Nilakant and Rao 1994).

2.6.4 Critique of AT

The universal application of AT is supported by Ross (1973), whereas Perrow (1986) does not value any application of the theory and states that it does not address a clear

²³ Note that this role of the principal is not entirely supported by the findings of this research as the highest form of integrating service provision includes managing sub-tier relationships, even though the integrator retains a provider role.

problem situation. Finally, Hirsch and Friedman (1986) criticise the contribution of AT, insofar as it is limited to the investigation of stock prices only. Furthermore, since it emerged from other disciplines that are based in the sociology literature, AT has not achieved a distinctive standing amongst organisational scholars.

Nilakant and Rao (1994, p.651) indicate the lack of empirical support and application of agency theory amongst theorists by questioning its usefulness due to a lack of rigorous formulations and models:

Little attention has been paid to it as a theory of performance outcome. This is partly because positivist agency theory, which is largely non-mathematical in its formation, has attracted greater attention whereas principal agent research has largely been ignored by organisation theorists. Consequently, there appears to be little discussion of the generalizability and usefulness of agency theory as a theory of performance outcome.

Other scholars criticise the PAT stream because of its limited view on organisations and the lack of rigorous models. Jensen (1983), for instance, claims that PAT does not analyse the organisation of the firm in terms of its internal functions and structure, but rather solely focuses on value- or profit maximisation, thus ignoring the complex systems. Furthermore, Hirsch et al. (1987) discuss the tautology of economic models and highlight the differences in scientific rigour between sociology and economics. They claim, positivist agency theory lacks strong empirical research and is less generalisable than sociological theories.

2.7 Developing Products, Service and Systems (PSS)

Over the last few decades, 'systems integration' has become a key concept for global corporations and large-scale industries, insofar as it serves as a progressive model for industrial organisations (Prencipe et al. 2003). In different sectors, such as automotive, telecommunication, military services and aerospace, the process of integrating a multiplicity of components and suppliers is a strategic task, primarily reserved for complex products and systems (CoPS). Emerging from the engineering practices of complex military systems, systems integration was introduced to industrial sectors as a way to provide solutions regarding the organisation of knowledge, skills, components and relationships across entire supply chains. Hobday et al. (2003) explain the emergence of systems integration within the ongoing and continuous processes of outsourcing. They

state that the “accompanying process of outsourcing [...] [is a] key factor in organizing the production of products and services” (Hobday et al. 2003, p.11). Consequently, the practices of outsourcing and the integration of systems go hand in hand in helping to explicate the nature of service provision and its boundaries, as it is crucial for this thesis.

Driven by an increase in complexity of products and systems, as well as technological changes in the manufacturing of consumer goods, systems integration offers solutions to satisfy customer needs while also providing high value-adding services (Lewis and Roehrich 2009, Roehrich and Caldwell 2012). Nowadays, the focal firm, especially in large-scale industries, operates across many different sectors due to extended outsourcing practices in order to provide more value-adding services and solutions to the customer. The changing core competencies towards managing and organising its outsourced production and distribution processes underline the firm’s ability to provide integrated solutions. Hence, this part of the literature review aims to extend the traditional view of outsourcing (or make-or-buy) to that of a systems integration perspective.

The following section describes the origins and historical development of business systems integration and outlines the importance of this concept, particularly with regard to CoPS. Based on the review of the systems integration literature, a connection between outsourcing and integrated solutions can be made in order to highlight the importance of service providers in logistics systems. Furthermore, this section explains the strategic positioning of firms further downstream the supply chain (i.e. approaching end-consumers), which according to the theory of service sciences, is more favourable in terms of profit margins. In this context, the focus is put on service providers and their contribution towards service enhancement. Consequently, the review evaluates the impact of service levels for the organisations and proposes a framework that encompasses a range of business practices based on the complexity (integration) of a particular system.

2.7.1 Beyond the Traditional View of ‘Make-or-Buy’ (2)

Recent literature, concerning management and business strategy, challenges the neo-classical approach of economic theories by proposing more customer-centric strategies (Prahalad and Hamel 1990, Quinn 1999). This suggests that firms should focus on providing high-value services to their customers, rather than attend to the production of physical product. A firm's competitive advantage is defined not only by the services it provides, but also by combining these services with products, in bundles, as integrated

solutions (Slywotzky 1996, Wise and Baumgartner 1999, Slywotzky et al. 2007). Producers of supplying components or services for capital goods and CoPS warrant a position in the value chain, where they can address their customers' needs and requirements as quickly and efficiently as possible. With origins in manufacturing, these suppliers move downstream the supply chain in order to provide services; as they get closer to the end customer, opportunities arise for building long-term and close customer relationships (Davies et al. 2001). Consequently, firms have, of recent, begun to place more emphasis on the distribution, maintenance and financing of their products. Furthermore, these widely adopted high-value services can be implemented throughout the whole life cycle of a product or capital good and therefore represent a constant source of revenue. In particular, case study research demonstrates that more and more firms are positioning themselves further downstream in the value chain towards the end customer, a phenomenon known as 'forward integration'²⁴ (Wise and Baumgartner 1999). Pioneer firms that developed the capabilities of designing, producing and integrating the necessary product and service components into integrated solutions are, e.g. Nokia (Wise and Baumgartner 1999), IBM (Gerstner 2009), Alstom and Ericsson (Davies 2004).

The approach of system integration is very similar to the strategy and practices characteristic of vertically-integrated supply chains (Lonsdale 1999, Parker and Anderson 2002, Christopher 2012). However, while vertical integration places a great deal of emphasis on backwards integration in order to increase the efficiency of components' supply and replenishment processes, systems integration focuses on a more customer-centric strategy through 'forward integration'²⁵. The integration of services into the manufacturing of core products is the main objective of the systems integration approach. The following sections focus on systems integration primarily from a manufacturer's perspective by outlining different models and discussing the implications of a coordination of the network. The theoretical background of systems integration is wide spread and can therefore be appropriated to into different contexts within the economic

²⁴ This represents a crucial point in the contribution of this thesis, where this research differs from supply chain management research. SCM usually focuses on the backwards integration from a focal firm's perspective.

²⁵ Note that systems integration, in this thesis, refers primarily to the forward integration (i.e. towards the customer and end-consumer), whereas traditional SCM practices emphasise backwards integration with suppliers or sub-tier provider firms.

development of organisations (see, for instance, the 'visible hand' approach by Chandler (1977)) and the boundaries of a firm, paying particular attention to what a firm does and what a firm knows. Furthermore, standardised processes and the division of labour both contribute to the competitive advantage of implementing integrated solutions. Hobday et al. (2005) mention that systems integration for large organisations, such as General Electrics, Dell, Ford, HP, BAE Systems, ABB, Siemens and McDonnell, to name a few, became integral to their success. Hobday et al. (2005, p.1110) define the approach of systems integration as the capabilities of firms, government agencies or other actors, which together combine all the necessary inputs for a system and suggest a path for future systems development:

In the narrower sense of firm capability, systems integration is concerned with the way in which firms and other agents bringing together high-technology components, subsystems, software, skills, knowledge, engineers, managers, and technicians to produce a product in *competition with other suppliers*. [Emphasis added]

Systems integration combines subsystems, components and skills from different functions and organisations and is thus fundamentally essential for the manufacturing of products, wherein activities are more costly, more complex and more technologically advanced.

Notably, empirical research on systems integration has only been conducted from an industrial manufacturer's perspective (Hobday et al. 2005). This section highlights the need to evaluate the role of service providers to understand how they can position themselves in the marketplace by providing high-value integrated solutions, rather than act solely as basic suppliers of services.

2.7.2 Background and Assumptions of Systems Integration

The origins of systems integration date back to the 1940s and 1950s. Systems integration techniques arose during and after the Second World War, given the long history of systems development in the railway and electricity network industries (Rosenberg 1963, Hughes 1993). The United States first developed proper processes during the Cold War period, led by new techniques and due to technological innovations. Rising costs and increasing complexity of distribution networks and weapon systems, for instance, forced the United States to develop new approaches for their military systems. Sapolsky (2003, p.19) describes the Second World War as a "weapon production race, while the cold war

was a weapon development race, where technological performance mattered more than numbers”. Weapon technologies, such as nuclear weapons, ballistic missiles and jet propulsion, which were introduced in the Second World War, required renewal, due to competition during the Cold War. The traditional approach of sequentially producing individual parts one after the other became outdated. Consequently, no single firm or organisation was able to manage the increasingly complex designs and processes anymore. The United States was the first country to integrate different processes, including engineering and managing, into single projects such as the 'Polaris' missile system and the project 'Atlas' in the 1950s (Prencipe et al. 2003)²⁶. These projects required the coordination of engineering activities, different companies, technologies and scientists working together (Hobday et al. 2005).

The incorporation of new technologies and components in weapon systems (e.g. radar and electronic control elements) made the design and production more difficult and more complex than ever before. Hobday et al. (2005), for instance, outline that the number of parts for an aircraft turbine increased from 9,000 to 20,000 between 1946 and 1957. Accordingly, the costs of these weapon systems increased steadily. Rather than just focusing on single subsystems, contemporary systems are holistic, intentional and designed from beginning to end, incorporating different activities across functional boundaries, such as R&D, production, procurement and the replenishment of components. Hence, systems engineering as a discipline, which paid considerable attention to holistic versus single subsystems, emerged in the late 1940s as Hobday et al. (2005, p.1118) describe it:

The idea was that an integrated system was a whole greater than the sums of its parts and that entire weapons systems, and their components had to be designed together concurrently (e.g. airframe, electronics, and armaments) so that the system could be integrated successfully.

Military projects continued to become more integrated in the 1950s, where a single organisation was assigned to integrate engineering activities of whole systems. The 'Manhattan Project', for instance, focused on the development of the first nuclear warhead and implemented an approach that involved different teams working together under the

²⁶ For a further description and explanation of these two projects, refer to Prencipe et al.'s (2003) book, *'The Business of Systems Integration'*.

co-ordination of a single systems organisation²⁷ (Hobday et al. 2005) in order to structure the chaos²⁸.

Following its first application in military programmes, the systems approach was exploited in industrial projects (Davies et al. 2007, Vargo and Lusch 2008, Roy et al. 2009, Wilkinson et al. 2009). Its very first application was in the telephone network by Bell Labs in 1950, where maintenance was organised through systems engineering. Eventually, integrated practices transferred from military services to civilian sectors, forged a close relationship between those two industries. Knowledge and technological practices were traditionally exchanged separately between industries. Subsequently, as the pace of technological change in industrial organisations increased, “military systems makers began to rely on commercial producers, such as Texas Instruments and IBM for key components and subsystems” (Hobday et al. 2005, p.1119). Hence, production processes of specialised components, such as microchips or semi-conductors in commercial production, were also used in military systems. In return, firms, such as Texas Instruments and Motorola benefit from the further capitalisation of their technologies.

Today, systems integration is concerned with organising major projects across industries and aims to improve production processes across the value stream in order to meet the customers’ unique and rapidly changing requirements (see Section 2.7.4 for downstream integration and the customer-centric approach). Hobday et al. (2005) distinguish between systems producers of military and civil systems (e.g. BAE systems in the United Kingdom used for aerospace and military projects), referring to these separate processes as prime contractors and systems integrators²⁹, respectively. Prime contractors delegate outsourcing activities, such as production and design, to external suppliers. The task of integrating the whole system, however, can itself be outsourced itself to supplier firms,

²⁷ This was evidenced after a merger between the consulting firm Ramo-Wooldridge and an automotive parts manufacturer Thompson Productions, forming Thompson-Ramo-Wooldridge (TRW).

²⁸ In his short book, *'Cure for Chaos'*, Ramo (1969) addresses the question of finding 'fresh solutions to social problems through the systems approach'. He argues that while military programmes clearly define their goals, social issues are not easily solved. He concludes that systems analysing cannot solve social problems because society will not pay the price that industrial or government projects can afford or are willing to pay.

²⁹ Hobday et al. (2005) illustrate the capabilities of contemporary systems integrators in a production pyramid using the example of BAE Systems.

which then act as systems integrators. Here, the question about who has agency and how is it transferred across organisations within an industry arises. This notion of outsourcing systems integration capabilities is a key element in the analysis and discussion of the introduced cases in this thesis. Moving from standard outsourcing providers to the provision of integrated systems, in particular in service supply chains and the context of the logistics industry, is a key unit of investigation in this research.

Integration versus Specialisation

The process of outsourcing and specialisation, as was outlined by Pavitt (2003), occurred as a result of technological breakthroughs in the nineteenth century; for example, in the machine tool industry (Rosenberg 1963). Since then, technological breakthroughs have promoted the strategy of vertical dis-integration in different industries. The availability of technology was no longer limited to large firms but could also be applied by smaller specialised firms. In-house manufacturing was no longer a competitive advantage for large organisations and could be undertaken by smaller specialised firms. The rise of outsourcing across different industries³⁰, such as in electronics, demonstrates how suppliers not only specialise in product manufacturing and design, but also undertake complex engineering activities (Sturgeon 2002).

Even though increasing specialisation of firms contradicts the trend of vertical integration (i.e. vertical dis-integration), the concept of vertically-integrated systems became the main strategic choice of firms during the second part of the twentieth century (and is usually related to the increasing trend of SCM in both practice and academia (Christopher 2012) that emerged in the late 1990s). Across many industrial sectors, firms tended to perform backwards integration along the value chain from a focal firm's perspective. Main drivers for moving vertical integration were based on firms' needs to (1) ensure the smooth flow of raw materials into production process and (2) eliminate excess inventory at different stages of the supply chain. Davies (2003) attributes the shift from vertically-integrated organisations towards outsourcing based on firms' core competencies. The increasing complexity of capital goods required more tailored and adjustable product specifications than the standardised consumer goods did. Consequently, firms moved

³⁰ Note here that outsourcing processes are not limited to operational activities and peripheral functions, as was introduced in the operations and strategic management literature earlier in this chapter.

away from the approach of vertical integration in the 1980s and relied more on outsourcing of specialised products. By outsourcing specific functions and processes that were previously handled in-house, a firm can gain competitive advantages (Domberger 1989), as is also explained by the resource-based theory (see section 2.4).

As a result of continuous outsourcing and dis-integration practices, several authors argue that a new form of organisation has emerged, whose core competency is the integration of systems, i.e. responsible for the management of outsourcing functions (Brusoni et al. 2001, Dosi et al. 2003, Pavitt 2003, Prencipe 2003). Pavitt (2003) states that the existence and emergence of systems integrators is caused by continuous specialisation and outsourcing strategies³¹, which ultimately result in opportunities of vertical dis-integration. Hence, outsourcing or vertical dis-integration is a key function in the practice of systems integration, as is described by Hobday et al. (2005, p.1126):

Firms can only outsource if they acquire the capability to integrate the components, knowledge, or software then produced by their specialist suppliers and subcontractors.

A firm's boundaries and its positioning along the value chain are determined by its strategic choice of outsourcing and its integration of functions and processes. According to the nature of the product or service in terms of standardisation or complexity, firms can position themselves in different ways along the value chain. Moving downstream of the value chain – towards the customer – is grounded in the assumption that the provision of services results in higher profit margins. Therefore, this downstream approach applies particularly to complex products and systems (CoPS), rather than the production of standardised consumer goods. Wise and Baumgartner (1999) offer a useful framework that shows how firms reposition themselves in the value chain and provide more value-adding services. Hence, firms provide value through the provision of services and the development of unique solutions, rather than the one-off selling of a product.

2.7.3 Complex Products and Systems (CoPS)

As was outlined in the previous section, firms tend to combine services and products in order to provide high-value integrated solutions for complex products and systems

³¹ See also section 2.3 for theoretical perspectives on outsourcing practices, such as Adam Smith's theory on the division of labour.

(CoPS) (Davies 2004). The following subsection outlines the nature and characteristics of CoPS and discusses their distinctiveness compared to standardised consumer goods. Hence, systems integration is the central activity in terms of value creation for organising and managing CoPS. In the context of this research, these systems integration capabilities serve as the basis for the later analysis of the case studies and different archetypes of service provision as a part of the initial conceptual framework.

The Nature of CoPS

Studies surrounding large organisations and the project management literature call for greater understanding of industrial products, particularly those originating from military systems, in terms of their complexity. In order to identify adequate measurement metrics and outline the scope of the analysis in this thesis, it is essential to offer a clear definition of CoPS. Hobday (1998, p.690) considers the following to fall within the scope of CoPS:

High value products, capital goods, control systems, networks and civil engineering constructs [such as] telecommunications exchanges, flight simulators, air traffic control units, systems for electricity grids, offshore oil equipment, intelligent buildings and cellular phone network equipment.

Typical characteristics of CoPS are that they are individually purchased by single or a small number of customers and require a formal type of contract, which is usually long lasting over the life cycle of a product or service. The difference between CoPS and standard capital goods are summarised in Table 2.7. CoPS are high-cost capital goods, small in volume and specifically tailored to the customers' needs that emphasise on the integration of systems with the bundle of services (McKelvey 2003, Hobday 1998).

In contrast to consumer goods industries that produced standardized products in high-volume for large final consumer markets, CoPS are produced as one-off projects or in small tailored batches to meet the particular needs of government, institutional, and business customers (Davies 2003, p.333).

The number of customised components and the in-depth of technological knowledge and skills required for the design and production of CoPS reflects their complexity. Due to the high complexity of subsystems and the innovation inputs they require, CoPS remain unique and therefore "differ from low-cost, mass-produced consumer goods comprised of standardised components" (Davies 2003, p.339). Typical examples of CoPS that are mentioned in the literature are flight simulators (Miller et al. 1995), telecom networks

(Davies et al. 2007) and aero-engines (Prencipe 1997). Furthermore, Michael Hobday (1998) offers numerous examples that illustrate the wide variety of potential CoPS. He explains that even low-tech projects, such as roads or construction projects, may require the application of new technological knowledge as it is given by computer simulation and sophisticated IT systems. The design of CoPS and its subsystems includes more suppliers and components that have to be managed and integrated than do mass-produced or standardised goods. The following Table 2.7 illustrates a comparison of CoPS and mass production industries.

	CoPS organisation	Commodity product
<i>Product Characteristic</i>	Complex component interfaces Multi-functional High unit cost Product cycles last decades Many skill/knowledge inputs Tailored components Upstream, capital goods Hierarchical / systemic	Simple interfaces Single function Low unit cost Short product life cycles Fewer skill/knowledge inputs Standardised components Downstream consumption goods Simple architectures
<i>Production Characteristic</i>	Project / small batch Systems integration Scale-intensive	High volume, large batch Design for manufacture Incremental process, cost control
<i>Innovation Process</i>	User-producer driven Highly flexible Innovation and diffusion collapsed Innovation paths agreed <i>ex-ante</i> amongst suppliers, user, etc. People-embodied knowledge	Supplier-driven Formalised, codified Innovation and diffusion separate Innovation path mediated by market selection Machinery embodied knowhow
<i>Competitive Strategies and Innovation Coordination</i>	Focus on product design and development Organic Systems integration competencies Management of multi-firm alliances in temporary project	Focus on economies of scale / cost minimisation Mechanistic Volume production competencies Focus on single firm (e.g. lean production, TQM and MRP II)
<i>Industrial Coordination and Evolution</i>	Elaborate networks Project-based multi-firm alliances Temporary multi-firm alliances for innovation and production Long-term stability at integrator level	Large firm / supply chain structure Single firm as mass producer Alliances usually for R&D or asset exchange Dominant design signals industry shakeout
<i>Market Characteristics</i>	Duopolistic structure Few large transactions Business to business Administered markets Institutionalised / politicised Heavily regulated / controlled Negotiated prices Partially contested	Many buyers and sellers Large numbers of transactions Business to consumer Regular market mechanisms Traded Minimal regulation Market prices Highly competitive

Table 2.7: Comparison between CoPS and Mass-Production Industries

Source: Adapted from Hobday (1998, p.699).

As outlined in the literature, CoPS and mass-produced goods are distinctly contrasted. CoPS are uniquely designed, produced to last for decades and represent a long-term investment. On a production level, CoPS consist of many subsystems and different components that are customised to meet special needs. In contrast, mass-produced consumer goods consist of relatively few components and are designed in a rather simple and duplicable manner. Such distinctions between standardised and more integrated product characteristics serve as the basis for the later analysis in this thesis and the different types of service provision for the case studies.

Standardisation versus Customisation

In opposition to the generally accepted view that CoPS are never mass-produced and a commodity product's life cycle is rather short, Hobday (1998, p.701) points out that complex projects are simply at an early stage of the product life cycle of a consumer good and raises the question of "whether CoPS are really any different from simpler products or merely a reflection of the extent of the market". He argues that after the first user-producer interactions, which occur during the design stage of new product development and CoPS production characteristics, production becomes standardised as a result of an expanding market. He offers automobiles (Langlois and Robertson 1989), microcomputers (Langlois 1992) and electronic consumer goods as exemplary cases. The main distinction between these two processes remains the user involvement during the design process: Where mass-produced goods are determined by the innovation of the market, CoPS represent a high degree of user and client interaction during the innovation process³². Tailored product systems and customised products that are designed to meet particular needs are relatively less modularised than mass-produced goods. Hobday (1998) further points out that CoPS can never reach the stage of mass-production and can only exist in the early stages of design and development³³. These product systems feature a low degree of standardisation, modularisation and outsourcing, in comparison to mass-produced consumer goods. The importance of integration, however, is more relevant for

³² More information on the involvement of users and suppliers in the service industry are located in the literature on performance-based contracting (Selviaridis and Norrman 2014).

³³ The findings of this research later reveal that particular archetypes of service provision demonstrate a similar behaviour. When service boundaries are closely linked to physical assets, the provider firms cannot maintain to manage an entire system.

CoPS than for high-volume commodities. By offering an integrated solution rather than a standardised product, profit margins are higher due to the value of service margins. Hobday et al. (2005, p.1132) underlines the distinction between mass-produced consumer goods and customised projects by emphasising the importance of integrated systems:

In complex products, systems integration is always core to production, whereas in mass-produced goods it becomes a routine part of manufacturing during the high-volume stage of the product life cycle.

Relevant business management literature claims that profit can only be gained if products and their components are highly standardised (Davis et al. 2007). Such systems result in successful growth because they are more compatible and can easily be adjusted to meet specific needs. Davies et al. (2007, p.186) suggest that firms should offer standardised products combined with enhanced service components:

By developing a basic modular system of components that can be easily configured for a variety of customer needs, suppliers can combine the cost advantages of producing standardized product components with high flexibility in system design.

In their evaluation of systems sellers and systems integrators, Davies et al. (2007) attempt to identify the most efficient organisation for integrated solutions. Sellers of integrated systems must not only focus on the integration of one-off projects, but rather emphasise the long-term relationship with suppliers throughout the product life cycle. Firms benefit from suppliers' economies of scale for standardised components and can provide additional high-value services in order to provide an integrated solution. Davies et al. (2007) describe the ideal type of systems selling as having extensive control over all components and having the ability to offer bundled packages at set prices. Alternatively, systems integrators only integrate outsourced components and specialise in component level management, whereas systems sellers vertically integrate backwards with suppliers and forwards with customers.

Hence, the distinction between standardisation and customisation is an important factor in identifying integrated solutions for a firm. Systems integration emphasises the coordination of components from external suppliers, which might or might not be standardised. However, firms must offer additional services in order to “expand the capabilities and range of components that can be combined to create value for [their] customers” (Davies et al. 2007, p.188). For the purpose of analysis in this thesis, service

provision is evaluated based on systems integration capabilities and the ability to provide bundled services.

Service Characteristics in Integrated Systems

Services are presumed to be more stable and reliable sources of revenue because there is no need to invest in a physical product (Bharadwaj et al. 1993) and also the revenue generated from services – in particular downstream services – represents 10 to 30 times the value of a product (Wise and Baumgartner 1999). Hence, the economic climate and recession that results in a depression of consumption does not directly affect the provision of services. Furthermore, firms require more services as the technological complexity increases and higher specialisation necessitates the outsourcing of services (Oliva and Kallenberg 2003). Providing services as a complement to products and components increases the value of integrated solutions by offering customised bundles to customers. In order to provide an integrated solution, firms must offer value-adding services in CoPS, whilst maintaining low-cost production associated with commodity goods. Davies (2003, p.339) characterises services for the use in CoPS if they:

- Are customised to meet each buyer's unique needs
- Allow greater scale (range) and scope (intensity) of services per unit (product) of output
- Provide higher margins and recurring revenue streams during relative long life cycles of services
- Occur before, during and after a product is delivered to the customer

As mentioned earlier, CoPS are characterised by long-term relationships between suppliers and customers. The offered services must be adjusted to the customers' needs in order to gain higher profit margins throughout a product's life cycle. In contrast to consumer goods, where services are typically offered post-sale (i.e. warranties and maintenance services), in CoPS, services are tailored to meet specific customers' needs prior to the sale. In order to make the most effective use of a purchased product or system, Oliva and Kallenberg (2003) point out that manufacturers must adopt these service requirements, insofar as they are seeking to transition from producers to service providers. Services, however, must not be restricted to the product alone and should “encompass all services required by the end-user to obtain a desired functionality, i.e. use the product in the context of its operating process” (Oliva and Kallenberg 2003, p.164). They also note

the following three main advantages for manufacturers, when transitioning towards the provision of more integrated services:

1. Lower customer acquisition costs
2. Lower knowledge acquisition costs
3. Lower capital requirements

Manufacturers can benefit from these advantages by providing complementary services, since they are the experts with regard to product specification and technologies. Furthermore, they are heavily involved in the sales process and thus are able to adjust their offered services accordingly, throughout the life cycle of the product (Oliva and Kallenberg 2003). However, this view is challenged by the findings of this thesis, insofar as the implementation of customer interaction and systems capabilities is not present amongst providers of highly standardised and physical service operations.

2.7.4 High-Value Integrated Solution Models

The previous section characterised systems integration as the delivery of high-value services in order to fully satisfy customer needs throughout the product life cycle. Andrew Davies (2003) advocates for the oscillation between production and service (Wise and Baumgartner 1999, Oliva and Kallenberg 2003) and argues that manufacturers and service providers should incorporate both. Davies further suggests that it is not enough to simply add services, but rather firms should to integrate high-value services as core competencies within their business models. Wise and Baumgartner (1999) mention that the annual demand growth for products has decreased over the years between 1960 to the mid-1990s by 1.5% in the US economy, while the service economy has grown by 16% during that same time period. Consequently, service activities are more attractive to manufacturers in terms of revenue generation, as they represent up to 30 times the value of the underlying product. Hence, value from the perspective of systems integration can be understood as the ability to provide integrated service solutions.

Value-Adding Activities and Capabilities

In order to understand how services create value in CoPS, this section identifies the value-adding activities that represent the services provided to the final customer. Wise and Baumgartner (1999) propose that firms must move downstream towards the final customer and engage in more distribution activities. Having control over the distribution

channels gives retailers and/or distributors purchasing power, insofar as they are able to communicate directly with the final customers and respond quickly to their needs. Upstream suppliers are only able to increase their customers' loyalty by "attempting to move downstream to control channels to the final consumer" (Davies 2003, p.342). In his case study research, Davies identifies four different capabilities that firms must offer in order to provide integrated solutions. Contrary to Wise and Baumgartner (1999), Davies (2003) shows that firms do not always move in one direction (downstream) from a manufacturing or service background, but argues that firms originating in the service industry can also move upstream towards manufacturing products. These firms increase their capabilities of integrating equipment, sourced from external manufacturers by coordinating downstream activities for their customers. Consequently, firms offer integrated solutions regardless of whether their basis lies in manufacturing or service provision, by developing the following four complementary types of capabilities:

- Systems integration
- Operational services
- Business consultancy
- Financial services

Davies (2003) found that it is critical for firms to develop these capabilities in order to provide integrated solutions. Hence, for the later analysis and development of the initial conceptual framework in this thesis, these systems integration capabilities are considered and applied to service provision amongst the investigated case firms.

The first capability is that of developing 'systems integration' as a core competency in order to offer bundled products and services. The customer can "purchase the whole bundle or parts of it from a single source" (Davies 2004, p.736) according to their individual needs. To further explicate this phenomenon, Davies uses the example of IBM and Sun Microsystems. These IT vendors offer both individual services and full packages to their customers ranging from the design of an IT system to the integration and management of computer hardware systems. Systems integrators use bundling as their core capability in order to "increase the range of activities performed [...] using components sourced from external manufacturers" (Davies 2004, pp.746-748). Cooperation and/or joint ventures with partners guarantee the satisfaction of customers' unique requirements. As a result of increasing demand for integrated solutions, the capability of systems integration requires firms to supply different products and services

and necessitates the management of activities, such as designing, constructing, testing and integrating complete systems.

The second main capability encompasses the know-how of a firm's 'operational services'. Systems integrators place themselves in a strategic position to undertake services and maintenance activities during the whole life cycle of a product. Additional services could, for example, include pilot training for flight simulators or baggage handling for airport networks (Davies 2004), to name a few. Key here is that the integrator firm understands the complexity of the offered products in order to provide additional services, contributing to the system's operational efficiency.

The last two additional capabilities are 'business consulting' and 'financial services'. These services "support and underpin the creation of value by providing inputs at different stages up and down the [value] stream" (Davies 2004, p.735), as is illustrated in the following Figure 2.10.

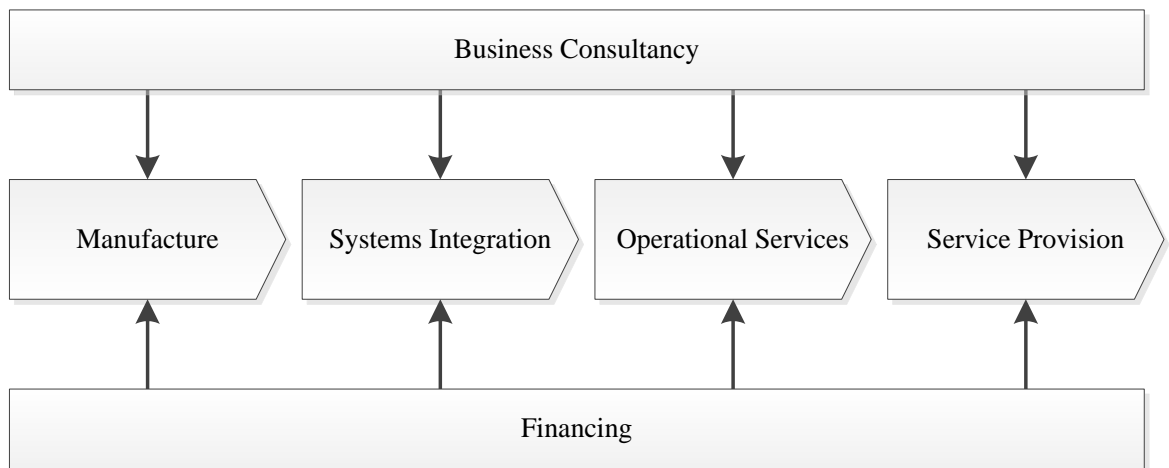


Figure 2.10: Supporting Service Capabilities in Capital Goods

Source: Davies (2004, p.738).

Andrew Davies points out that there is an increasing demand for additional consulting and financial services for firms to add value to their capital goods and systems. Offering these services is particularly important for firms in the contract negotiation stages. The focal firm is able to offer consultancy to their customers in terms of planning, designing, building and financing, as well as maintaining and operating the product. However, the types of consulting and financial services change during a product's life cycle. Customers with a low level of technical capabilities, for example, may require support in terms of close partnerships and consultancy services in an early stage of the bidding phase "to discuss business plans, user requirements and conceptual solutions, prior to specifying

and integrating systems” (Davies 2004, p.735). On the other hand, customers with high experience in technical solutions and capabilities may only require support at a later phase of product development. Financial services are also crucial, in particular in the negotiation phase, when customers need support in financing a purchased product or system. Slywotzky and Morrison (1998, p.245), for instance, mention that the financial engagements with customers in the negotiation phase can “open doors to a host of projects that might otherwise have been unavailable” as cited by Prencipe et al. (2003).

The Value Stream Approach in Capital Goods

As an extension to Wise and Baumgartner’s (1999) downstream business model, Davies (2003, 2004) adopts the value stream approach in order to outline a set of value-adding activities within an industry. Whereas Baumgartner's framework only considers a firm's internal activities in the market place, Davies goes beyond this assumption. Davies follows Porter's (1990) later view that a firm's value chain is not only limited to its in-house activities but is rather embedded in a “larger stream of activities” (Porter (1990, p.42) as cited in Davies (2004)). Hence, the focus on value creation is extended to activities that span beyond the boundaries of a focal firm along the value chain from raw materials to the final customer (Womack and Jones 2010).

The two traditional value stream stages of manufacturing and operational services have developed considerably since the mid-1990s. And nowadays, specialised firms compete and cooperate in vertically dis-integrated value streams due to outsourcing practices and sourcing strategies. Davies et al. (2001) identify four main stages or activities in the value stream of the capital goods industry caused by vertical dis-integration. Figure 2.11 illustrates the activities in the value stream of a capital good, such as a railway or telephone network, where the hardware components represent the upstream movement of raw materials and the passengers or telephone users represent the downstream movement to the final customers or end-consumers. The four core stages (highlighted in bold in the figure) represent the value-adding activities throughout the life cycle of a product or system.

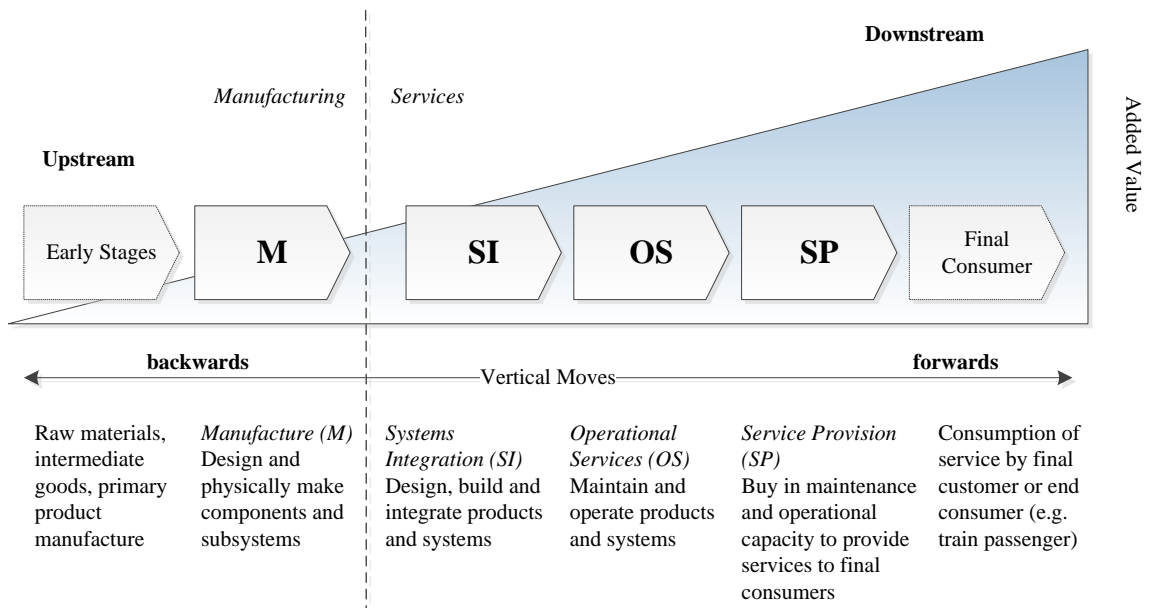


Figure 2.11: Capital Goods Value Stream

Source: Adapted from Davies (2004, p.737).

‘Manufacture’ (M): The first stage includes the transformation of raw materials and assembly parts into physical components and sub-systems.

‘Systems integration’ (SI): The second stage of integration adds value through integrating several components, sub-systems, and services. It includes the provision of whole and complete systems to the final customer according to their needs.

‘Operational services’ (OS): In the third stage, operators or users run and maintain the system and provide services, such as luggage handling or error detection.

‘Final service provision’ (SP): The last stage represents the provision of enhanced services to the final customer. Service operators are firms that buy operating systems and focus on marketing, financing, distributing, and customer care activities.

Davies (2003, 2004) highlights how value can be added to a product or system based on the interactions within an industry rather than from the sole perspective of an individual firm. The value stream approach illustrates different stages, “where the outputs of one value-adding activity are the inputs of the next, making the overall value stream” (Hobday et al. 2005, p.1133).

The following example, as mentioned by Davies (2004) and Hobday et al. (2005), illustrates the repositioning of firms in the value stream of the mobile network industry in the mid-1990s. Originally, Ericsson and Siemens were suppliers, focusing on the

manufacturing of equipment and components for operators of mobile phone networks. These mobile phone operators kept the knowledge and capabilities of integrating those equipment and components – sourced from their suppliers – in-house. They supervised and organised the building of their networks through external suppliers, by conducting outsourcing. The operators of the mobile phone networks then started to outsource the systems integration task to a new kind of service provider in the late-1990s. Companies like Virgin Mobile emerged, the so-called “mobile virtual network provider” (Hobday et al. 2005, p.1133) and focused on service provision, such as marketing, advertising and customer care activities. These new service providers basically buy capacities from operators and employ or process their own communication traffic through their network.

2.8 Literature Synopsis and Conceptualisation of Service Provision

Drawing from the delineated literature review, the following section presents the initial conceptual framework and identifies the theoretical constructs used to understand the phenomenon of service provision and systems integration in the context of logistics service outsourcing. Furthermore, additional research questions have been derived for the purpose of this thesis. The theoretical constructs also serve as the basis for the semi-structured interview guide that supports the data collection process for this research. Figure 2.12 summarises the theoretical assumptions from the literature review and illustrates the starting point for the development of the constructs and an initial conceptual framework.

This thesis links the identified literature streams and theories (RBV, TCE, AT and SI) to re-define service provision boundaries in order to better explain and understand the development of a continuum of service provisions, as well as the role of systems integrators. This summary of the extant literature is further narrowed to the theoretical constructs discussed in the next section.

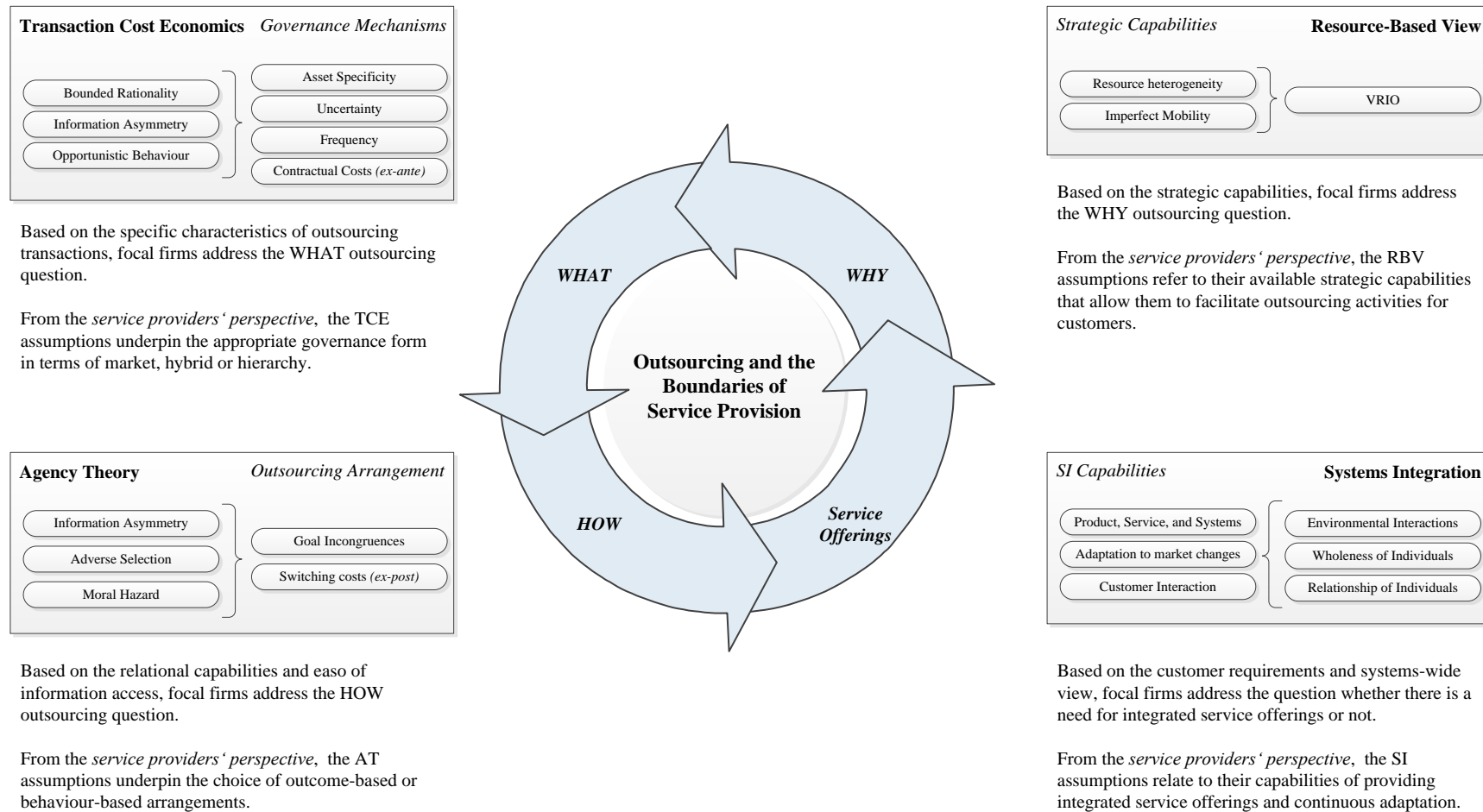


Figure 2.12: Summary of Relevant Literature Streams

2.8.1 Development of Theoretical Constructs

Following the explanation of the theoretical assumptions in this comprehensive review of the literature, the following subsection identifies the application of the theoretical constructs of RBV, TCE, AT and systems integration on service provision and highlights the gaps in the literature. It is worth noting that only those literature sources that focused specifically on the perspective of the service provider were considered.

Application of RBV to Service Provision

Olavarrieta and Ellinger (1997, p.559) point out that there has been “no clear exposition of the [RBV] approach [...] in the logistics literature”. Following this statement, subsequent research has aimed to identify a unified theory of logistics (Mentzer et al. 2004) and the interest in logistics capabilities and competences has become increasingly important (Halldórsson and Skjøtt-Larsen 2004, Halldórsson et al. 2007). Table 2.8 presents the theoretical constructs of RBV, applicable to service provision.

RBV constructs	Item description	Source
<i>Core Capabilities</i>	3PL provider's capabilities impact competitive advantage	Hsiao et al. (2010b)
	Strategic orientation of service provider's capabilities and impact on performance.	Yeung et al. (2012)
	Impact of integrating provider firms' capabilities on a firm's performance.	Jayaram and Tan (2010)
<i>Physical Assets</i>	Characteristics of logistics facilities and equipment for warehousing and transportation services.	Karia and Wong (2013)
	Rarity of transportation resources and the level of automation in logistics operations across competitors.	Reeves Jr et al. (2010)
	Technological and peripheral equipment required for logistics activities.	Karia and Wong (2013)
<i>Relational Capabilities</i>	Flexibility and ability of service providers to make adjustments in their service offerings.	Hartmann and De Grahl (2011)
	Coordination and collaboration capabilities of service providers regarding trust, commitment and willingness to share information.	Karia and Wong (2013)
<i>Knowledge and Training</i>	Transfer of knowledge between buyer and supplier in terms of exchanging information.	Hartmann and De Grahl (2011)
	Impact of 3PL providers' knowledge and capabilities on performance.	Yeung et al. (2012)
	Human assets and the extent of which dealing with vendors implied change(s) for staff and the overall logistics function.	Barthelemy and Quelin (2006)
	Skill set and knowledge of personnel and the degree of how management actively participates in formulating its logistics strategy (TCE perspective).	Poppo and Zenger (1998)
<i>Organisational Capabilities</i>	Business culture and management practices of provider firms, and adaptation to customer changes.	Karia and Wong (2013)

Table 2.8: Theoretical Constructs and Items of RBV and Literature Sources

Application of TCE to Service Provision

Rindfleisch and Heide (1997) summarise empirical research across multiple disciplines that discuss the governance problems and mechanisms using TCE logic. They investigate the validity of transaction cost frameworks following Williamson's (1992) call for empirical research to extend the focus and refine TCE. The following Table 2.9 presents the identified constructs of transaction cost economics that are applicable to the understanding of service provision and logistics outsourcing in this thesis.

TCE constructs	Item description	Source
<i>Uncertainty</i>	Constant and predictable demand for logistics activities, and long-term value of logistics operations.	Reeves Jr et al. (2010)
	Price for 3PL services fluctuates and logistics requirements change.	Lai et al. (2012)
	Technological uncertainty and change of IT and systems configuration in relation to the underlying skills and performance in rapidly changing environments.	Poppo and Zenger (1998)
	Changing measures for evaluating performance of logistics activities.	Hsiao et al. (2010b)
	Environmental uncertainty of difficult to predict future trends in terms of expected capabilities.	Barthelemy and Quelin (2006)
<i>Frequency</i>	Relationship length and characteristics of outsourcing arrangements.	Chu and Wang (2012)
	Frequency of operations in maintaining logistics capabilities (RBV perspective).	Karia and Wong (2013)
<i>Asset Specificity</i>	Acquisition of company specific information to adequately perform outsourcing activities and impact on the outsourcing relationship that requires initial investment costs.	Poppo and Zenger (1998), DeVita et al. (2010), Kutlu (2012)
	Degree and amount of investments into special equipment to conduct logistics activities, and their impact on asset risk and performance.	Hsiao et al. (2010b), (Tsai et al. 2012)
	Emphasis on human and procedural asset specificity instead of physical assets.	Vandaele et al. (2007)
<i>Small Numbers Bargaining</i>	Major 3PL is the only source of logistics services and commits to focal firm's vision.	Chu and Wang (2012)
<i>Switching Costs</i>	Investigates time and costs to switch suppliers and re-integrate outsourced activities.	Barthelemy and Quelin (2006),
	Availability of service provider and 3PL firms impact focal firm's performance.	Chu and Wang (2012)
<i>Contractual Costs (ex-ante / ex-post)</i>	Cost of switching suppliers (<i>ex-post</i>) in terms of training providers, making investments, developing working relationships etc.	Poppo and Zenger (1998)
	Negotiating <i>ex-ante</i> costs are high due to opportunistic behaviour of supplier firm.	Lai et al. (2012)

Table 2.9: Theoretical Constructs and Items of TCE and Literature Sources

Application of AT to Service Provision

The application of agency theory to supply chain management and logistics is primarily advanced by Stock (1997), who calls for more theoretical research in logistics. Fayezi et

al. (2012) present, in their structured literature review, the extent of how agency theory explains the dynamics and relationships in supply chains. They identify different areas, such as purchasing, marketing, strategic management, SCM and logistics, where agency theory can be applied in the context of SCM. However, the majority of studies address agency relationship through a network perspective in order to understand the wider complexity of supply chains, rather than investigating dyadic relationships between buyers and providers of services. On a different note, Gilley et al. (2006) mention two different ways of applying agency theory to outsourcing. First, they view the relationship between a firm and a third-party as the principal-agent relationship. Second, the contract between the two parties are approached in terms of five agency cost characteristics, namely, uncertainty of the outcome, aversion of risk, task programmability, measurability of the tasks and the length of the agency contract. Table 2.10 summarises and supports the identified constructs of AT that are applicable to service provision in the context of this thesis.

AT constructs	Item description	Source
<i>Goal Incongruences</i>	Major 3PL provider cares for customers and considers focal firm's welfare as well as their own (opportunistic behaviour).	Chu and Wang (2012)
	Goal incongruences and risk preferences in dyadic relationships between supplier and buyer firms.	Halldórsson and Skjøtt-Larsen (2006)
	Focal firm is dependent on 3PL to achieve goals in terms of sales and over time 3PL is expected to increase percentage of logistics services.	Chu and Wang (2012)
	Willingness to share risk in after-sale supply chains.	Kim et al. (2007)
<i>Information Asymmetry</i>	Importance of information sharing between supplier and customers and importance of information sharing systems.	Jayaram and Tan (2010)
	Information sharing with 3PL firms in terms of shipment tracking and available capacities.	Chu and Wang (2012)
	Mitigation of risk in buyer-supplier relationships through behaviour-based techniques.	Zsidisin and Ellram (2003)
<i>Moral Hazard</i>	3PL provider exaggerates its needs and will not provide a completely truthful and transparent picture while negotiating.	Lai et al. (2012)
	Uncertainty about providers' outcome performance and measurability of performance.	Whipple and Roh (2010)
<i>Adverse Selection</i>	Selection criteria for 3PL services in terms of service level, correct quantity, on-time delivery, flexibility, communication skills, and quick response.	Jayaram and Tan (2010)

Table 2.10: Theoretical Constructs and Items of AT and Literature Sources

Application of Systems Integration to Service Provision

The review of the literature on systems integration and advanced service provision mainly draws from an industrial marketing perspective, incorporating ideas from Andrea Prencipe, Andrew Davies and Mike Hobday, primarily. However, the application of

systems integration and related philosophies to outsourcing and logistics systems is evident in the notion of how provider firms add value to the logistics function³⁴. The identified constructs of systems integration capabilities are summarised in the following Table 2.11, considering their applicability to service provision.

SI constructs	Item description	Source
<i>Product, Service and Systems</i>	Strategic positioning and classification of service providers.	Persson and Virum (2001)
	Evaluation of logistics research based on an analytical and systemic approach.	Gammelgaard (2004)
	Application of a holistic view on sourcing decisions in order to analyse networks.	Shook et al. (2009)
<i>Adaptation to Market Changes</i>	Implementing organisational innovation in order to analyse and identify logistics performance and to identify areas for improvement following a systemic approach.	Persson (1993a)
	Implementing increasing reverse logistics as a company-wide initiative.	Genchev (2009)
<i>Customer and Consumer Interaction</i>	Application and evaluation of supplier relationships from a systems theoretical perspective, individual pieces of collaboration processes relate to inventory success.	Fawcett et al. (2010b)
	Implementing measurement and performance model systems across supply chain partners, from a systems perspective.	Holmberg (2000)

Table 2.11: Theoretical Constructs and Items of SI and Literature Sources

In a next step, the identified constructs (amongst the four relevant literature streams) are combined into an initial conceptual framework that serves as the basis for the understanding of service provision boundaries in the context of logistics systems, from the provider firms' perspective.

The initial conceptual framework serves as a starting point for contextualising service provision boundaries and incorporates the key theoretical assumptions, which guide the later data collection and analysis processes in order to ultimately explain and justify the development of four service provision archetypes. These four proposed archetypes will be introduced later, and explained in the methodology chapter of this thesis (see section 3.4.3 for the sampling and allocation of firms to archetypes).

³⁴ The idea of adding value to the logistics function represents the common and widely accepted understanding of 4PL providers; thus is used in this thesis as a starting point to describe the systems integration capabilities of service providers.

2.8.2 Development of an Initial Conceptual Framework

Figure 2.13 illustrates the initial conceptual framework that distinguishes between different types of service provision and structures their relation to the theoretical constructs. The initial three types of service provision include: (1) standard outsourcing activities; (2) highly integrated activities; and (3) the continuous adaptation of systems.

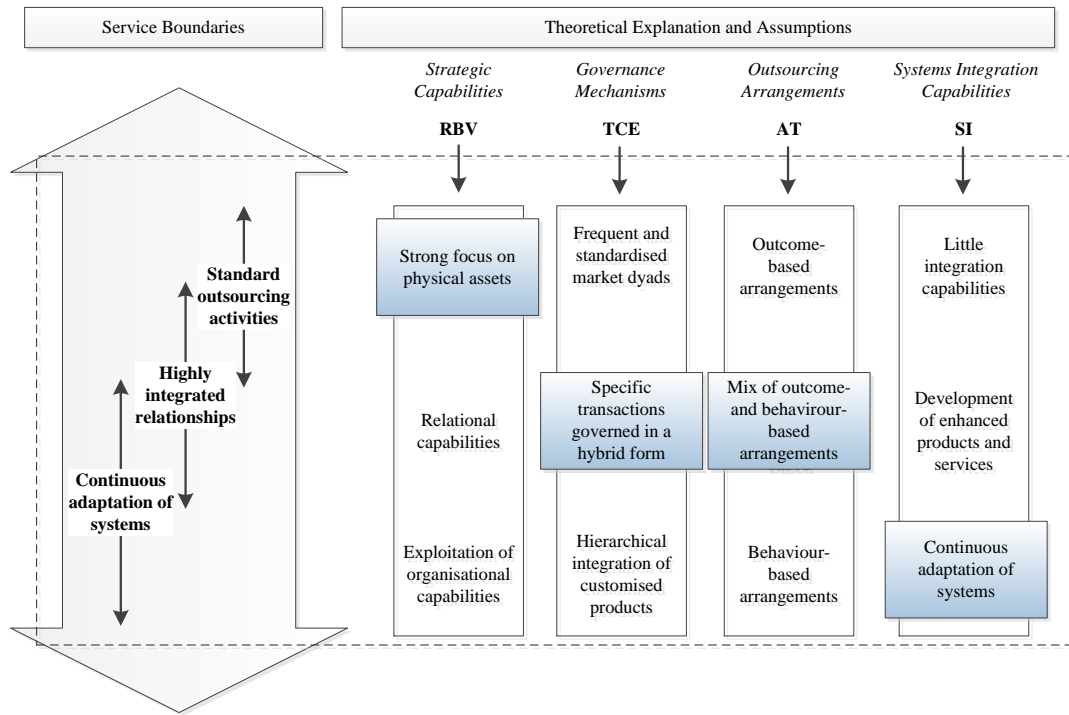


Figure 2.13: Initial Conceptual Framework

The case study findings in this thesis build on this distinction by introducing different archetypes of service provision, all of which represent an amalgam of service firms. For the further understanding of the case study design, the initial types of service provision can be described as follows:

‘Standard outsourcing activities’ represent firms that offer their services primarily in a market (dyadic) structure, following relational rather than contractual arrangements. For this type of service provision, emphasis is placed on the products and transactions rather than additional services.

‘Highly integrated relationships’ represent service firms that are conventional referred to as 3PL providers and tend to build contractual relationships, following a hybrid governance structure. These firms’ core competencies span beyond the simple provision of operational transactions and include combined services in the form of service bundles.

The ‘continuous adaptation of systems’ refers to firms whose core competencies include the organisation and management of entire supply chains or networks. The governance structure is hierarchical in order to best exploit the firm’s systems integration capabilities.

The initial conceptual framework illustrates and highlights the proposed continuum across different archetypes of service provision, such as market, hybrid and hierarchy, with regard to the level of systems integration and service provision. In this way, the initial conceptual framework combines the originally considered streams of insourcing and outsourcing, as well as systems integration assumptions.

2.8.3 Derivation of Research Questions

Drawing on the literature in operations management research on outsourcing practices, the following two research questions aim to identify and conceptualise the phenomenon of service provision:

Research Question One: What has been the focus, nature, salience and influence of research in service outsourcing and how has it changed over time?

Research Question Two: How can the combination and the multiplicity of existing theories from different disciplines explain the provision of services boundaries from the provider firms’ perspective?

Following the comprehensive review and evaluation of the literature, theoretical constructs help to develop an understanding of how firms’ behaviours change by contextualising the proposed service provision continuum:

Research Question Three: How do provider firms within different archetypes of service provisions exploit their idiosyncratic and individual capabilities?

Research Question Four: How can the boundaries across different archetypes of service provision be delineated?

This chapter started by reviewing the literature on outsourcing strategies and the provision of services from the theoretical perspectives of the resource-based view of the firm, transaction cost economics and agency theory. The relevant constructs were then combined with assumptions from the servitisation literature, forming an initial conceptual framework. Finally, four research questions were derived and serve as the fundamental starting point for the contribution of this thesis.

CHAPTER THREE:

RESEARCH PHILOSOPHY AND METHODS

The following chapter provides an overview of the research philosophy and methodology that has been applied in this thesis. The first section introduces different philosophical stances and positions that explain the researcher's perception of reality (ontology) and understanding of knowledge transfer and development (epistemology). This section introduces different research paradigms and explains how they are adapted to research in the field of operations management. The following section 3.2 explains the research approach and process that was adopted in the thesis. Section 3.3 describes the research strategy of a case study that was deemed appropriate for this project. Based on the philosophical stance of the researcher, the methodology and research techniques were formulated. Section 3.4 expands on the various considerations involved in case study design, such as case selection and the unit of analysis, through which the methods of collecting and analysing data were derived and presented. The chapter concludes with a description of the credibility, reliability and validity of this research.

3.1 Philosophical Stances and Paradigm Plurality in Social Science Research

Thomas Kuhn, in his 1970 seminal work on *'The Structure of Scientific Revolution'*, offers new insight into what we understand as the intertwining between science and discovery. Kuhn (1970) coins and defines the term 'paradigm', which refers to the boundaries of which mature scientific communities frame and structure their work. He supports and explains this insight given the fact that scientific discovery represents a clear cyclical process. However, he does not believe that a research paradigm is the sole solution to any social problem. A paradigm rather guides and confines research into a framework that allows various phenomena and ideas to be organised and evaluated (Mackenzie and House 1978). In summary, a research paradigm represents a "philosophical framework that guides how scientific research should be conducted" (Collis and Hussey 2013, p.43) and subsequently refers to the beliefs and worldviews of

the researcher (Denzin and Lincoln 2009). Three philosophical concepts structure the fundamental nature of knowledge, reality and existence in social science research; these are colloquially understood as ‘ontology’ (the nature of reality and being), ‘epistemology’ (the nature and theory of knowledge) and ‘methodology’ (the nature of how knowledge is obtained and investigated). Figure 3.1 illustrates the cluster of these substantive concepts.

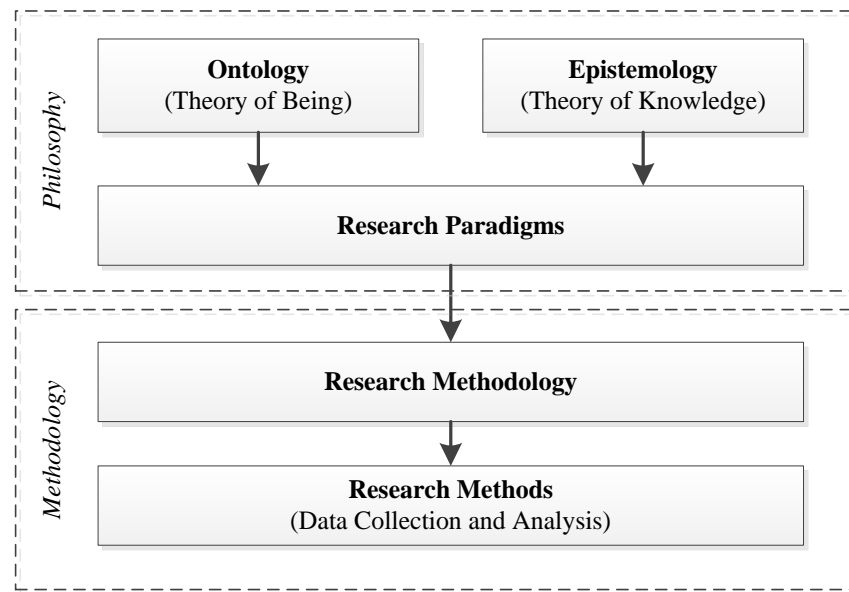


Figure 3.1: The Relationship between Ontology, Epistemology and Methodology

Source: Adapted from Crotty (1998) and Sarantakos (2012).

In short, different philosophical concepts or paradigms are characterised by their ontological and epistemological considerations that underpin the assumptions of social science research as discussed in the following subsections.

3.1.1 Philosophical Paradigms in Management Research

Philosophical stances in social science research are the fundamental basis for any research project. More importantly, the “role of research is to test theories and to provide material for the development of laws” (Bryman 2012, p.15). This interplay between theory and data (Pugh 1983) suggests that observations and data collection cannot be considered as strictly scientific and therefore require distinct philosophical paradigms that guide each specific research project (Hussey and Hussey 1997, Creswell 2013).

Different research paradigms – also referred to as ‘school of thoughts’ – have emerged over the centuries (since the days of the ancient Greek philosophers, such as Plato and

Aristotle from 500 B.C.) and are concerned with the development of knowledge and the theory of being. Philosophers and researchers have always been concerned with the foundations of science, the development of arguments and assumptions, the use of methods and the implications of scientific discoveries on society (Brannigan 1981). Every paradigm has its own distinct research strategies, axioms, theories, and data collection and analysis methods that reflect the nature of the researcher and allow for the inference of conclusions about real world phenomena in social sciences. The knowledge generation process refers to the researcher's perception of what reality is, what it looks like, and how he or she perceives, understands and makes sense of the world (see the below definition of epistemology). As was previously mentioned, three main concepts have emerged in the social sciences, namely (1) ontology, (2) epistemology and (3) methodology. The so-called 'three -ologies' impact the changing nature of research and delineate how management scholars conduct research. They shed light on the theory of being, the theory of knowledge and the philosophy of science, respectively.

The 'Three -ologies' in Social Science Research

As outlined above, each philosophical paradigm follows certain ontological, epistemological and methodological assumptions.

'Ontology' refers to the nature of reality and acquisition of knowledge. As the theory of being, it aims to describe what the researcher perceives as reality and therefore explains the nature of social entities and phenomena. The two distinct polar perceptions of reality are known as 'realism' and 'nominalism', which refer to the nature of reality as being either objective or subjective, respectively.

'Epistemology' refers to the nature and theory of knowledge. It aims to understand and explain what is, what should be regarded as acceptable knowledge and how social science research communicates it. The two opposed epistemological perspectives are 'positivism' and 'constructivism'. Whereas positivism refers to an objective process of accepting knowledge that can be generalised; and constructivism is the process of creating knowledge through experience that implies little degree of generalisability³⁵.

³⁵ The issues related to the generalisability of this research are further discussed in section 7.2 with regard to proposed avenues for future research in section 7.6.

‘Methodology’ refers to the way in which knowledge of the world is obtained and investigated. Methodology is the philosophy of science and guarantees that the results of an inquiry of investigation represent the ontological and epistemological beliefs of a research paradigm.

The following subsections describe the three main paradigms used in management research, namely ‘positivism’, ‘interpretivism’ and ‘critical realism’, based on their ontological, epistemological and methodological assumptions.

3.1.2 Positivism as a Stance in Management Research

Positivism assumes that there is an external and observable social world and holds that the individual observer is not subject to study (Easterby-Smith et al. 2012, Collis and Hussey 2013). Emerging from the physical and natural sciences, positivistic thinkers, such as Auguste Comte (1852), David Hume (1817/1874) and Immanuel Kant (1787), introduced and developed the idea that social phenomena can only be measured through objective methods. Comparable to the natural sciences, positivism is grounded on the assumption that methods and procedures from natural sciences can be applied to social interactions, where the outcome of research represents causal and value-free laws and generalisations (Giddens 1974). The *ontological* perspective of positivism is that there exists an external and objective reality that the researcher believes is observable (Wass and Wells 1994). The *epistemological* perspective thereafter focuses on the external and objective observations that result in significant and commonly acceptable knowledge. Hence, observers attempt to adopt a value-free and external position when conducting research (Bryman 2012, Wass and Wells 1994). The *methodological* procedures follow a deductive approach to measuring and testing concepts in a quantitative manner (Easterby-Smith et al. 2012). This paradigm stresses the objective, immutable and generalisable nature of observations and findings (Bryman 2012, Easterby-Smith et al. 2012).

Positivism follows strict assumptions that cannot always be maintained and upheld. Common criticisms for a positivistic research stance include the limitations associated with adopting a single tangible reality, the separation of the observers from the observed, linear causality, the notion of value-free research, and the temporal, spatial and contextual qualities of observations that are not often taken into account (Lincoln and Guba 1985). Table 3.1 summarises the key characteristics of the positivistic research paradigm.

Positivistic Assumptions	Explanation
<i>Reality</i>	The belief in an objective (naïve) reality and there is only one such reality.
<i>Human Interest</i>	Objectivity is guaranteed. The aim is to separate the observer from the observed, and ensure value-free and generalisable findings.
<i>Research Process</i>	Hypothesis and deductive reasoning leads the investigation and observation of social phenomena.
<i>Unit of Analysis</i>	Reduced to a limited and manageable term.
<i>Generalisation</i>	Through statistical probability and significance testing.
<i>Sample</i>	Typically large sample sizes and randomly selected samples that represent entire populations.
<i>Explanations</i>	Observation methods are highly quantitative and represent linear causality; they offer a clear definition of the examined concepts and constructs following deductive logic.

Table 3.1: Assumptions and Attributes of Positivism

Based on these limitations and the fact that social phenomena involve human interactions and real-life experiences, management research cannot ignore the reflexivity and independence of individuals (Robson 2002). Therefore, a positivistic view is neither fully appropriate nor applicable for this study.

3.1.3 Interpretivism as a Stance in Management Research

Similar to the post-positivistic movement and in response to the dominance of positivistic research throughout the 19th century, interpretivism developed as a paradigm that identifies and highlights fundamental differences between the natural and social sciences (Schwandt 2000). The main focus of interpretivism is the *understanding* of social phenomena based on experience, which allows for the theorisation of ‘meaning’ in human behaviour (Weber 1924, Schutz 1954). Max Weber’s interpretation of social sciences recognises the ‘subjectivity’ and ‘self-consciousness’ of human beings as well as their ‘freedom of choice’. This distinction to natural sciences, where objects are external to the researchers, stems from the idea of phenomenology by Edmund Husserl (1964). Husserl argues that ideas are generated within the human mind and that there is a “clear relationship between investigators and investigated, researcher and the researched” (O’Gorman et al. 2014, p.63). Table 3.2 summarises the key characteristics of an interpretivistic research paradigm.

Interpretivistic Assumptions	Explanation
<i>Reality</i>	The observer is part of the reality.
<i>Human Interest</i>	Highly subjective and interaction with humans and the social world.
<i>Research Process</i>	Inductive research approach of interpreting rich data, such as ideas and experiences.
<i>Unit of Analysis</i>	Considers the complexity of the 'whole' as an entity.
<i>Generalisation</i>	Contextualising observed phenomenon in an abstract and theoretical manner.
<i>Sample</i>	Small sample sizes that are purposively chosen.
<i>Explanations</i>	Aims to increase the general understanding of a social phenomenon or behaviour.

Table 3.2: Assumptions and Attributes of Interpretivism

The *ontological* perspective of interpretivism assumes that reality is not represented by an underlying objective truth or reality (Mir and Watson 2000), but is socially constructed and given meaning by human beings (Easterby-Smith et al. 2012). The *epistemological* perspective, therefore, implies that people are part of what is being studied; people create meaning, which leads to the *methodological* assumption that observers interpret an empirical reality based on a subjective consciousness (Lee 1991).

From an interpretivist perspective, findings in social science research are not objective; rather researchers formulate and propose theories based on their individual subjective perceptions of reality (Mir and Watson 2000). Consequently, different researchers will draw different interpretations and derive disparate explanations of certain phenomena.

3.1.4 Critical Realism as a Stance in Management Research

As a result of the limitations of the positivistic paradigm and its dominance, particularly in social science research, a growing number of scholars have advocated for a change in how to view the world. This challenge of overcoming the limitations of positivism is referred to as 'post-positivism' (Giddens 1978, Koch 1980, Polkinghorne 1983) and introduces realism as a new perspective in social sciences (Outhwaite 1987). Hirschheim (1985) states that knowledge is a belief that does not necessarily follow claims that are accepted by a community. This new way of thinking criticises the to-date accepted physical and quantitative models as the sole method for knowledge acquisition. However, post-positivism is vague, does not delineate a particular doctrine or suggest propositions and is, therefore, not necessarily perceived as a new school of thought. In a similar vein, Roy Bhaskar's (1975) seminal work on *'The Realist Theory of Science'* resulted in the

development of ‘critical realism’, which is an acknowledged philosophical paradigm.³⁶ The origins of critical realism are partly inspired by Marx’s view of science (Alvesson and Skölkberg 2009). The main contribution therefore, that critical realists offer to social sciences, is its ability to combine the radical abstract, stemming from social constructivism and the empirical i.e. non-theoretical) characteristics of positivism. The positioning of critical realism as an alternative paradigm to the post-positivistic views of interpretivism reflects the differences in ontological and epistemological perspectives.

Critical realists has led to a so-called methodological pluralism (Morgan 1980, Polkinghorne 1983), which puts forth “the assertion that there is no one correct method of science but many methods” (Hirschheim 1985, p.32). Table 3.3 summarises the key characteristics of the critical realism research paradigm.

Critical Realist Assumptions	Explanation
<i>Reality</i>	Critical or transcendental realism assumes that there are multiple objective realities in the social world (post-positivism).
<i>Human Interest</i>	Separate observer from the observed that results in value-laden findings.
<i>Research Process</i>	Theory led approach of exploring reality based on socially constructed dimensions and an objective reality.
<i>Unit of Analysis</i>	Reduced to simple terms but may include multiple dimensions in order to capture the complexity and interactions of social behaviour.
<i>Generalisation</i>	Generalisation relates to the research context and can be applied to a broader social world to a limited extent.
<i>Sample</i>	Large or small number of cases, selected purposively to describe a social phenomenon.
<i>Explanations</i>	Reasonable and stable relationships between social phenomena are assumed. Causal links are probabilistic and may change over time.

Table 3.3: Assumptions and Attributes of Critical Realism

Critical realism asserts that a socially constructed and independent reality exists based on its own inherent order (Outhwaite 1987, Sayer 2000). However, it acknowledges the impossibility for humans, with their imperfect intellectual capabilities based on bounded rationality, to completely and perfectly perceive any social phenomenon (Cook and Campbell 1979, Guba 1990). Contradictory to positivism, critical realism argues that reality and social behaviour act independently of one another and thus descriptions are

³⁶ The philosophical stance of critical realism shares certain values and assumptions with ‘critical theory’ that is commonly associated with the Frankfurt schools of thought that originated in Germany around 1923.

required to understand the underlying structure that guides the acting of things that exist (Bhaskar 1975). On another note, critical realism challenges the constructivist interpretivism paradigm by arguing that there is not only one naïve reality that can easily be explored (Easton 1998). This challenge indicates that researchers should establish methods, which aim to uncover reality, rather than accept a socially constructed world without an explicit ontology. In this way, the problems associated with adhering to one of the two polar ontological distinctions are mitigated and the researcher is not forced to choose, but can rather oscillate between the two poles (Fleetwood 2005). This is also referred to as ‘ontological dualism’ between structure and agency, objects and subjects (Knights 2000).

Even though critical realism acknowledges that a ‘real’ world is not perfectly apprehensible (Outhwaite 1987, Tsoukas 1989, Guba and Lincoln 1994), the paradigm accepts an objective reality and proclaims that knowledge is subjective and partly socially constructed, insofar as it follows certain patterns and structures (Tsang and Kwan 1999). From a critical realist’s perspective, social phenomena are theory-driven and researchers should go into the field with a theory in mind. Miller and Tsang (2011, p.144) underpin that “critical realism takes a balanced and modest stance regarding the prospects for affirming and rejecting theories based on empirical evidence.” Consequently, critical realism, with the added assumption of methodological pluralism, serves as the most appropriate research paradigm for this thesis.

3.1.5 Summary of Paradigms in Management Research for this Thesis

To summarise, each of the three discussed research paradigms in social sciences differ in their ontological, epistemological and methodological perspectives, but can nonetheless all be applied to management research.

Table 3.4 presents positivism and interpretivism as distinct and polar opposites, where positivism follows purely quantitative methods and interpretivism follows purely qualitative methods to investigate social phenomena. Critical realism is, thus, proposed as an appropriate paradigm in operations management research as it reflects the philosophical underpinnings and perceptions of the individual researcher in this study.

Paradigm	Positivism	Critical Realism	Interpretivism
<i>Ontology</i>	Social world is objective to individual cognition and reality is external to the researcher and context and value free.	There is an objective reality that individual researchers believe in, but it can never be perfectly captured.	Observers construct their reality based on their individual observation and experience, by theorising their findings.
<i>Reality</i>	<i>There is only one reality.</i>	<i>Reality can never be fully understood.</i>	<i>There are multiple realities.</i>
<i>Epistemology</i>	Individual researcher separates him- or herself from the research process and meaning is assumed to be part of the reality. The observer tries to avoid biases in the research process.	Meaning is understood as an interaction between the observer and the investigated phenomenon that is seen as an objective reality. Objectivity is not fully reduced but the observer aims to distant him or herself from the research process.	Meaning is derived from observing and experiencing objects and behaviour. The researcher aims to interact with the observed phenomenon following a subjective perspective.
<i>Knowledge</i>	<i>Hard findings are true and value-free.</i>	<i>Findings are value-mediated.</i>	<i>Subjective and value-laden findings.</i>
<i>Methodology</i>	Experiments, Surveys, Simulation models, Statistics, Longitudinal studies, Cross-sectional studies	Action research, Case studies, Feminist studies	Ethnography, Grounded theory, Phenomenology, Case study narratives, Feminist studies, Hermeneutics

Table 3.4: Research Paradigms in Management Research

Source: Synthesised from Guba (1990) and adapted from (Roehrich 2009).

The following subsections introduce different research approaches and methodological strategies applied in managerial research. In addition, the research design and process for this thesis, adopting a philosophical stance of critical realism, is discussed.

3.2 Research Approaches in Operations Management

Management studies in Western research traditions offer two distinctive approaches of explaining and exploring phenomena in social sciences, those of ‘deductive’ and ‘inductive’ reasoning (Hyde 2000, Taylor et al. 2002). Deductive approaches adopt a positivistic perspective to test and investigate hypotheses, propositions and/or theories that are derived from existing literature or research, using empirical data. Deductive research primarily uses quantitative data in order to statistically confirm or falsify certain behaviour in social sciences, general laws or specific cases (Kovács and Spens 2005). Contrastingly, an inductive approach follows an interpretivistic philosophy and develops, rather than empirically tests, theories or propositions based on the behaviour of certain

phenomena. Inductive reasoning proceeds from collected data or observations to articulate general laws or theories (Kovács and Spens 2005). In this way, qualitative data is used to generate knowledge in unexplored areas or disciplines (Barratt et al. 2011). Here, the research process itself is as important, if not more so, than the findings, insofar as the process is subject to unexpected changes and thus shapes the outcome of the research.

In operations management research, the deductive positivistic approach is predominant (Mentzer and Kahn 1995, Näslund 2002), which is somewhat surprising given that disciplines in operations management, such as logistics or service provision, are relatively new, and could conceivably benefit from exploratory research, rather than empirically tested propositions. Because it is an emergent field, logistics and service science research readily borrows theories from other disciplines. Stock (1997), for instance, outlines several related disciplines and theories that can be applied to logistics research. Hence, there do not exist any developed theories or laws that can be specifically applied to the field. An inductive approach would allow for the explication of theories and descriptions of phenomena in this relatively underdeveloped domain. Thus accordingly, several authors have called for more inductive research and advocate the development of new theories in the research field of logistics and supply chain management (Stock 1997, Arlbjørn and Halldorsson 2002).

A third, albeit less popular research approach in operations management and logistics research is that of ‘abduction’ or ‘retroduction’ (Kovács and Spens 2005). This approach follows neither a purely deductive nor a purely inductive reasoning and can be referred to as an assemblage of different approaches. Peirce (1931) is generally accredited with first coining the term ‘abduction’, who traces its usage back to Aristotle. Even though there exists no universal definition, various schools of abduction have emerged based on Peirce’s work (Kirkeby 1994). Dubois and Gadde (2002) argue that research is not static and usually involves both deductive and inductive approaches. It follows that theoretical knowledge deviates from real-life observations, which can lead to the identification of new behaviour that matches theory within a certain phenomenon (Kovács and Spens 2005). Consequently, new theories can be derived or suggested based on observations of patterns in the social world. Such an approach is very common in case study research, where data collection and theory development occur simultaneously (Dubois and Gadde 2002, Kovács and Spens 2005, Roehrich 2009). Aastrup and Halldórsson (2008) highlight

the benefits of abductive reasoning, citing that the researcher can go back and forth between events in order to test and build theory through an iterative research process.

A summary of the three distinct research approaches is proposed by Kovács and Spens (2005, pp.133-137), where they distinguish between the research processes and describe the interplay between the theoretical part, including laws and generalisations, and the empirical part, such as cases and observations.

Deductive research follows a conscious direction from a general law to a specific case [...] contrary to this procedure, the *inductive* research approach reasons through moving from a specific case or a collection of observations to general law [...] the *abductive* approach follows yet another process, from rule to result to case. [Emphasis added]

Despite the fact that the abductive approach is not common in operations management research thus far, many implicitly use both approaches (deductive and inductive reasoning) interchangeably (Barratt et al. 2011). In particular, case study research always reveals some insight of an inherent theoretical understanding. Contrary to other disciplines, such as psychology, marketing and sociology, where the entity or the case itself serves as starting point for an investigation, in management research it is often a theory that drives the researcher to investigate a phenomenon. Therefore, it can be argued that even inductive case study research starts with an idea that is grounded in a management theory.

3.2.1 The Nature of Qualitative Research in Operations Management

Management research in the 1980s focused primarily on analytical paradigms and normative studies (Chase 1980, Barratt et al. 2011). Following several calls for more empirical rigour and relevance in operations management research (Eisenhardt and Graebner 2007, Fisher 2007), scholars responded with survey-based and quantitative, predominantly deductive studies. Today, qualitative case study research has generated increasing consideration amongst operations management scholars often viewed as an opportunity to “explore and better understand emerging, contemporary phenomena or issues in their real world settings” (Barratt et al. 2011, p.329). Most case study research follows an inductive approach; however, in Barratt et al.’s (2011) review of operations management literature, they found evidence of deductive case study research being used for theory-testing purposes. Although notably, those articles that used a deductive

approach “simply adopted an inductive logic for their deductive research” (Barratt et al. 2011, p.338). Therefore, this thesis argues that there is always a certain extent of theory building in qualitative case study research in management studies, even if the original intention is to test theories. Accordingly, an abductive approach was adopted for the purposes of this research, emphasising the use of qualitative case studies for theory testing purposes, as was suggested by Barratt et al. (2011).

3.2.2 The Abductive Research Approach for this Thesis

The present research on the provision of services and the system integration capabilities cannot be categorised as either purely deductive or inductive. Therefore, the adopted approach for this study was one of abductive reasoning (Dubois and Gadde 2002), that is, an iterative process of using deductive reasoning to test conventional theories that explain phenomena of outsourcing, and inductive reasoning to develop new theories and propositions in the discipline base of service provision, as well as explore the role and nature of systems integrators. To a certain extent, the empirical data collection overlapped with the conceptualisation of the theoretical constructs. An abductive approach (Danermark 2002, Aastrup and Halldórsson 2008) is consequently more accurate and represents a better account of the research process. The abductive reasoning logic that “commutes between theory and empirical findings” (Roehrich 2009, p.75), reflects the process employed in this research as outlined in the research framework (see Figure 3.2).

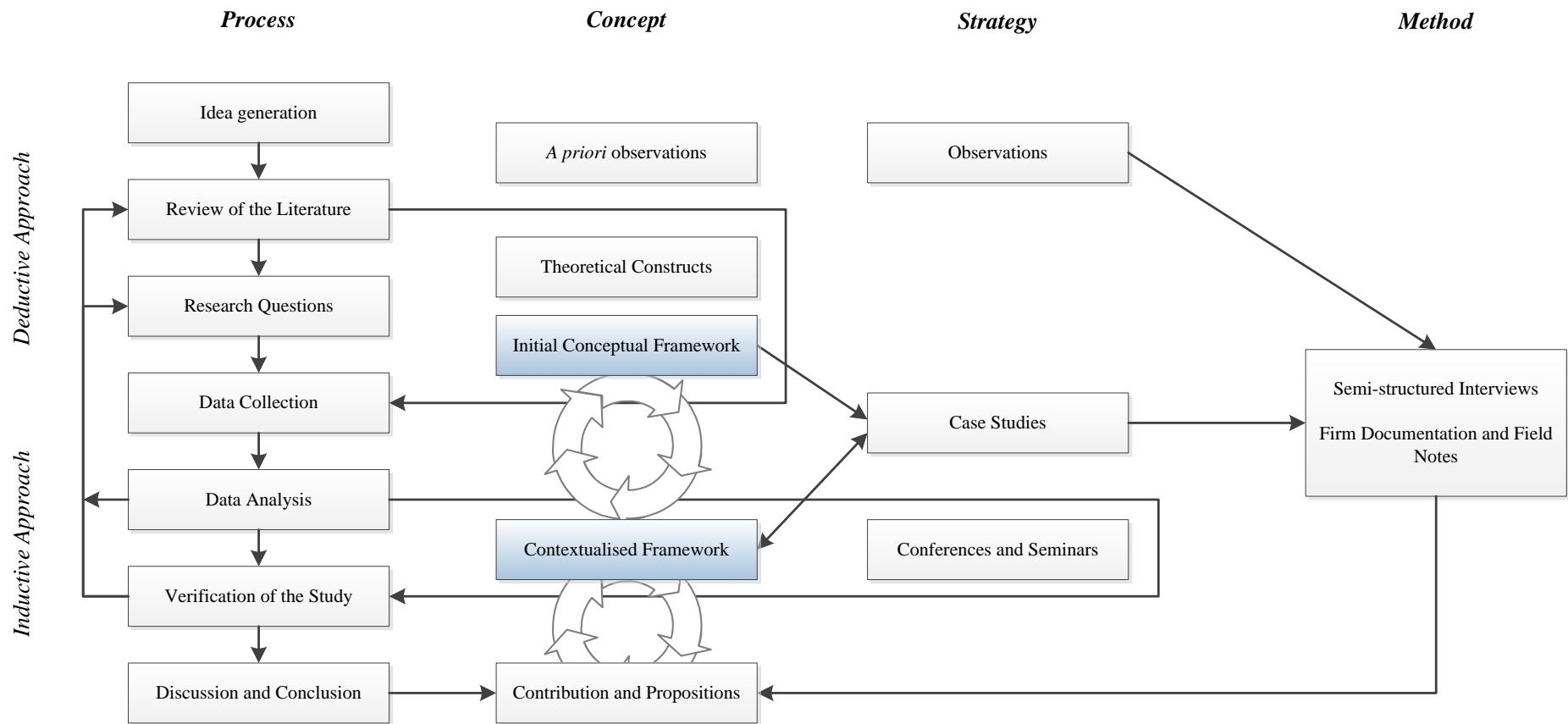


Figure 3.2: Research Approach as an Iterative Process

Source: Synthesised from Mentzer and Kahn (1995) and adapted from Roehrich (2009).

Yin (2014) stresses the need for research to follow a logical plan, from an idea to a reasonable conclusion, which consists of a logical order of choices (McGrath 1981). Following this, Mentzer and Kahn (1995) developed a framework that is suitable for logistics research but can also be applied to the discipline of operations management. Their framework describes the research process in six separate steps: (1) Formulate the problem and generate an idea; (2) develop theoretical constructs and research questions; (3) plan the study; (4) collect empirical data; (5) analyse and interpret empirical data; (6) present the results and derive conclusions and implications (Maylor and Blackmon 2005, Easterby-Smith et al. 2012). The process for this particular study can be described in three steps as illustrated in Figure 3.2.

First, the *formulation of the problem and generation of an idea* for the present research is given. Extensive research was undertaken about the boundary choices and governance forms of organisations in industrial and manufacturing industries. However, such research lacked of insight from the suppliers' and providers' perspectives. The well-established Logistics Research Centre (LRC) within the Business Department at Heriot-Watt University focuses on research on third-party logistics providers and logistics systems. Therefore, the idea of using logistics as a context or domain for this study originated based on the orientation of the centre and the researcher's interests. The providers' side of outsourcing relationships became the main focus of interest for this study and led to the problem formulation of investigating boundary decisions and governance choices from a service provider's perspective. The notion of systems integration in addition to the investigation of service provision boundaries attempts to avoid limiting the research focus to logistics. Hence, the present research idea fits within the operations management discipline as integrators of any kind develop such practices. This stage of idea generation and problem formulation served as the basis for the next step of developing theoretical constructs and research questions in the form of an initial conceptual framework.

Second, the *development of theoretical constructs and research questions* was based on the evaluation of conventional economic and sociological theories, such as the resource-based view (RBV) of the firm, transaction cost economics (TCE) and agency theory (AT) as well as the business of systems integration (SI). After establishing the research context in a comprehensive literature review, an *initial conceptual framework* was developed based on the assumptions and constructs of the aforementioned theories. This initial

framework, however, was extended to the propositions of four archetypes of service provision based on the researcher's initial findings and general understanding of service provision boundaries. This process also led to the development of research questions. The initial conceptual framework draws on the constructs from the theories in the context of service outsourcing and integration of systems within the logistics industry. The research questions address gaps in the literature on the definition of service provision and systems integration capabilities in logistics research. This stage of defining and planning the research led to the next step of conducting field research and data collection in the form of semi-structured interviews with logistics managers from various service providers, which were then analysed.

Third, following the data collection process³⁷, information from both the observations and interviews were analysed following *within-case analysis* and *cross comparison* methods (Miles and Huberman 1994). The main unit of analysis was the providers of logistics services, which served as the basis for the investigation of service boundaries and systems integration capabilities. The analysis methods strictly adhere to the previously delineated theoretical constructs and initial conceptual framework. The abductive approach of the research took place here and the framework was continuously developed throughout the data collection and analysis processes in an iterative manner. Also, preliminary findings were presented at academic conferences and workshops as a way to verify and discuss the study with scholars and practitioners; furthermore, the findings were submitted and published in the form of conceptual and empirical research papers to academic journals in the disciplines of supply chain and operations management.

In conclusion, the abductive nature of this research successfully combines deductive and inductive approaches. First, the research tests conventional theories that explain outsourcing relationships in the context of logistics and service supply chains. Second, the findings of the case studies support the researcher's intention to expand and build on these theories in order to develop a comprehensive model for outsourcing relationships in the context of service supply chains.

³⁷ The case study design is further described in section 3.3.3, which includes a discussion about the individual stages of the adopted case study research process.

3.3 Research Strategies in Management Studies

The research strategy in social sciences generally considers how research should be conducted and what it entails (Bryman 2012, Easterby-Smith et al. 2012). Different research strategies offer different advantages and disadvantages depending on the nature and purpose of the study. According to Yin (2014), three conditions apply when determining an appropriate strategy: (1) The type of the research question, (2) the control a researcher has over behavioural events and (3) the focus on contemporary or historical phenomena. Qualitative research is often used to explore, explain and/or describe phenomena or events (Marshall and Rossman 2010, Yin 2014). As was previously mentioned, qualitative research traditionally generates rich insights by exploring and describing circumstances that are largely unexplored in the literature, following an inductive approach. However, qualitative data can also be explanatory by showing “relationships [that are] perceived by the participants in the study, between events and the meaning of the relationships” (Marshall and Rossman 2010, p.68). The different reasons of conducting qualitative research of research in social sciences, all of which are considered in this study, are outlined in the following Table 3.5:

Purpose of Study	Research Question	Explanation	Research Strategy	Relevance to this Study
<i>Exploratory</i>	How, Why	Investigate poorly understood phenomena. The purpose of this strategy is to build theory and seek new insights.	Case study. Field study.	The study contributes to the development of a universal outsourcing model in service supply chains drawing on conventional economic theories.
<i>Descriptive</i>	Who, What, Where	Document and portray a phenomenon of interest in an accurate manner. This type requires previous knowledge of situations.	Survey. Field study. Case study. Ethnography.	The processes of service offerings and the structure and organisation of contractual outsourcing relationships are identified.
<i>Explanatory</i>	How, Why	Explain patterns of a phenomenon and seeks to identify plausible relationships.	Experimental. Multiple case study. History. Field study. Ethnography.	The analysis of the case studies reveals insight into organisational processes and the behaviour associated with outsourcing phenomena.

Table 3.5: Matching Research Purpose and Strategy

Source: Modified from Yin (2014), Marshall and Rossman (2010), adapted from Roehrich (2009).

3.3.1 Case Study Research

In social sciences, case study research offers the opportunity to gain deep insight and knowledge about a particular phenomenon or event in the context of a real-life setting. A comprehensive definition of case research in operations management is given by Jack Meredith (1998, pp.442-443), who states that “a case study typically uses multiple methods and tools for data collection from a number of entities by a direct observer [...] in a single, natural setting that considers temporal and contextual aspects of the contemporary phenomenon under study, but without experimental controls or manipulations”. Emphasis, in this thesis, is placed on the role of the observer and the contextual aspects of the phenomenon, such as the human behaviour and the bounded rationality of managers within organisations. Yin (2014) states that the boundaries between real-life phenomena and management research contexts are typically blurred and undefined as the number of variables in terms of relational links, operational processes, environmental changes, etc. is quite high and unwieldy, which results in the high complexity of entire systems. Hence, an in-depth investigation is required to overcome these conditions. In opposition to survey strategies that are limited to examining a few variables (Hellström and Nilsson 2006), case study research collects more accurate and reliable data (Voss et al. 2002) by focusing on various aspects of a phenomenon by evaluating numerous variables and relationships. Therefore, case research relies on multiple sources of empirical evidence (Robson 2002) in order to develop new theories or extend and/or test existing theories (Dubois and Gadde 2002, Roehrich 2009). The OM researcher’s intention is to understand company and employee dynamics as well as behaviour and interactions within real-life settings, and is based on a researcher’s ability to formulate unbiased propositions and hypotheses (Eisenhardt 1989b). The phenomenon itself is what is of interest to the researcher, whose purpose is to understand its affect and impact on the context of the study in order to develop and expand upon theoretical constructs and explanations (O’Gorman et al. 2014).

The preferred method of data collection in case-based research can be both of a qualitative and/or quantitative nature and includes observations, questionnaires and interviews. Methods for analysing empirical data can also occur on single or multiple levels (Yin 2014). Qualitative data in particular finds wide acceptance in case study research, in as much as exploratory examinations are useful for building theories in the early stages of any discipline and can offer fresh perspectives to pre-established research topics

(Eisenhardt 1989b). Controversially, the use of qualitative data gathered from case studies finds increasing acceptance and application in theory-testing and deductive approaches, despite the interpretative nature of qualitative data (Barratt et al. 2011). This thesis therefore benefits from both applications of case study research in that it (1) explores a phenomenon and (2) uses qualitative data as a way to explain certain behaviours.

The frequently reported benefits of case studies (i.e. description, understanding and explanation) are particularly relevant to studying new areas of research and are, in part, due to the generation of rich data sets (Yin 2014). In addition to acquiring deep insight, the researcher can also describe single phenomenon and “predict outcomes based upon past occurrences in similar cases” (Ellram 1996, p.99). Further justification of using a case study strategy relates to the fact that the researcher can look beyond an organisation’s boundaries and across different industries. Hence, case studies allow for the explanation of rather complex and intangible phenomena in business management, such as trust and relationships (Roehrich 2009). Where surveys and experimental research is limited to certain criteria as well as fixed and/or pre-set variables, case study research is able to both explore and explain whole entities.

However, some authors criticise the use of case studies due to their lack of generalisability (Eisenhardt 1989b, Bryman 2012, Yin 2014). Contrary to survey methods, the sample size in case study research is limited to a small number of cases, which might not be statistically significant and are therefore (amongst other reasons) considered non-generalisable. Furthermore, issues related to specific constraints, such as time, costs and accessibility, can significantly hinder the number of researched cases per project (Roehrich 2009). Eisenhardt (1989b), for instance, suggests that anywhere between four and ten cases is an appropriate number from which to build theoretical knowledge. However, the development of this new knowledge applies only to the selected cases and thus only explains a phenomenon within a very narrow and specific context. Surveys, on the other hand, deal with much larger sample sizes and are able to generalise to a wider population. In addition to the issues of generalisability, the lack of validity and rigour is a frequently cited source of criticism in case study research. In contrast to purely positivistic survey studies that claim to possess a high degree of objectivity, case studies are knowingly biased by a researcher’s views (Roehrich 2009). In case studies, an investigator’s acknowledged subjectivity influences the outcomes and directions for future research (Seuring 2008). The inability to identify misconstrued findings is

especially prevalent in single case studies, where the sample size is not representative enough and external validity is extremely low.

In order to strengthen external validity and address the lack of generalisability, this research adopts the strategy of a multiple case study. Ellram (1996) notes that the use of multiple cases increases the replicability of a study and therefore allows for the development of theoretical frameworks and robust theories grounded in rich empirical evidence (Eisenhardt and Graebner 2007). Furthermore, by investigating a single phenomenon using multiple case studies, replicable and reliable findings, in terms of conspicuous similarities and differences, are expected. (Eisenhardt 1989b, Voss et al. 2002).

3.3.2 The Nature of Case Study Research in Operations Management

Case based research in academia is more common in Europe than in North America, but still only accounts for less than five per cent of published papers (Pannirselvam et al. 1999). However, an increasing trend of applied case research in operations management is discernable (Voss et al. 2002). Meredith (1998) argues that despite the limited number of published case studies in operations management journals, these methods are preferred to traditional methods, such as simulation, optimisation and statistical modelling, due to the rigour of case study and field research. The major benefit of using case study methods in the academic discipline of operations management is the exposure it grants to real-life problems and scenarios. This thesis also acknowledges previous work on using case study methods in operations and supply management (Datta and Roy 2011, Caldwell and Howard 2014). Hence, the development of knowledge amongst researchers, who conduct case study interviews and/or observations, is immense insofar as it simulates creativity. The importance of case-based research in operations management is also highlighted in the review by Barratt et al. (2011), who stress the need for increased rigour in qualitative research, as it pertains to deductive approaches and case studies. They state that while a majority of qualitative case research start out using a deductive approach, they typically turn out to be more inductive in nature. Therefore, it is crucial to make a clear distinction, with regard to the implemented approach of case study research. For the purpose of this thesis, the deductive part of the study tests how conventional theories explain the service provision boundaries; the inductive part consists of developing a comprehensive

contextualised model that explores the systems integration capabilities based on the findings of multiple case studies.

Case study research in business studies uses empirical methods for data collection, such as interviews and observation, in order to reveal similarities and comparisons between firms and organisations (Sinkovics and Ghauri 2008). In their case study research on the competitive advantage of an industrial organisation, Netland and Aspelund (2013, p.1517) state, “the analysis of qualitative in-depth interviews is the most often applied methodology for firm-level international business research”. This is not surprising, as both the physical and the human elements within organisations are addressed in operations management research. For example, researchers have linked human behaviour to the arrangement of physical elements in production systems (Drejer et al. 2000, Voss et al. 2002). The following subsection describes the particular case study strategy applied in this thesis.

3.3.3 The Case Study Strategy for this Thesis

A case study approach has been chosen as the research strategy for this thesis for three reasons. First, from a theoretical perspective, this study aims to test conventional theories and their applicability to the context of service provision in the logistics industry. Furthermore, the findings contribute to the development of theoretical knowledge in operations management research by drawing conclusions from the proposed conceptual and contextualised framework. Second, case study research is appropriate for answering ‘why’ and ‘how’ questions and can therefore address inter-organisational behaviour and explain the boundaries of service provision, respectively. Third, the practical rigour of case-based research, through an iterative process of acquiring deep insight into systems integration as an extension to conventional outsourcing phenomena, contributes to the managerial implications proposed by the researcher.

Referring to the above underpinning research paradigm of this research, that is, critical realism, Kathy Eisenhardt (Eisenhardt 1989b, Eisenhardt and Graebner 2007), in a similar vein, discusses the use of case studies from a relativist point of view that falls between positivistic and interpretivistic views. She highlights the importance of a small sample size (four to ten cases) as a way to build theories by comparing findings and evidence with the extant literature. Such a theory generating approach is achieved by applying both

within-case analysis and cross comparison, which is the adopted technique of analysis in this thesis.³⁸

In order to overcome the weaknesses associated with case studies in terms of validity and reliability, the following section describes the analytical and systematic procedure that was followed whilst conducting case study research. The research strategy follows Yin's (2014) proposition of a linear, yet iterative process of doing case study research, as is illustrated in Figure 3.3. The individual phases represent a sequential interaction of events; however, these events are continuously constructed and reconstructed in light of new knowledge acquired at multiple stages of the entire research process, which further demonstrates the iterative nature of this process and case study research more generally.³⁹

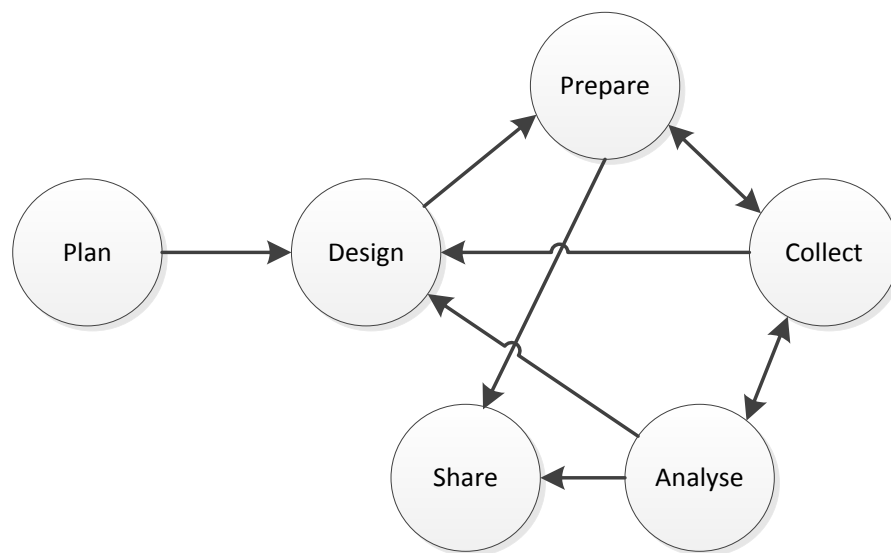


Figure 3.3: Iterative Steps of a Case Study Research Strategy

Source: Yin (2014, p.1).

The *planning stage* of this thesis started with the identification of a research topic and research questions. A case study design was selected as an appropriate research strategy based on its ability to address ‘why’ and ‘how’ questions. During the *design stage*, the unit of analysis that is the service provider was identified. At this point, case firms were selected based on certain inclusion and exclusion criteria. In the *preparation stage*, a semi-structured interview guide was developed (see Appendix B) based on theoretical

³⁸ The case selection and analysis procedures for the purpose of this thesis are further explained in sections 3.4.2 and 3.6, respectively.

³⁹ The iterative nature of redefining frameworks based on empirical findings is also discussed in Figure 3.3

constructs that address the service boundaries and systems integration capabilities from the service providers' perspective. In the *data collection stage* actual interviews with logistics managers were conducted forming the case study database. The design and content of the interview guide was modified accordingly during the data collection in order to increase the validity and relevance of the interview guide. The interview findings were then subject to inquiry, during the *analysis stage*, which included descriptive case analysis of the case firms' service provision and respective capabilities and a cross comparison of these findings amongst the cases. The analysis incorporated the previously developed propositions and constructs in order to test the theoretical assumptions of RBV, TCE, AT and SI in the context of service provision, following a deductive approach. Additionally, the research questions three and four were addressed and the theories on service provision and systems integration extended, in an inductive manner. Insofar as the data collection and analysis stage were conducted simultaneously, changes in both the design and collection methods occurred. For instance, company documents turned out to be valuable and critical sources of empirical data, despite the fact that they were not initially considered in the previous stages. Finally, the *sharing phase* involves the dissemination and presentation of relevant findings and conceptual frameworks to scholars and practitioners in the field of operations management. The researcher frequently attended academic conferences and workshops, such as EurOMA, IPSERA and LRN, in order to increase the practicability and applicability of the study. The final thesis is the ultimate outcome of this project, which reflects the entire research process.

3.4 Case Study Design in Management Research

Following the description of the iterative case study strategy adopted in this thesis, the subsequent section describes the implemented multiple case study design, as it pertains to the context of this research. Additionally, it highlights the case selection criteria and offers justification for the chosen unit of analysis.

3.4.1 Multiple Case Study Design for this Thesis

The fundamental distinction in the design of case study research is whether to conduct a single or multiple case study. The use of multiple cases in the present research lies in the objective of the thesis, to understand and articulate service provision boundaries amongst firms in the logistics industry. Such a phenomenon requires the investigation of constructs

that expand beyond a segregated entity or behaviour of a single company. While a single case study would certainly produce deeper insight into a particular event, it falls short with regard to its generalisability. However, the phenomenon of interest, i.e. the service provision continuum and the systems integration capabilities, is not a unique or even a rare event and organisations across a multitude of different industries face these challenges, as they are inherent of any supply chain. In this way, a multiple case study approach captures the breadth and the depth of the topic of interest.

The exploratory aspect of this thesis aims to develop a theoretical model based on the conclusions drawn from multiple case investigations. Acquiring insight from a multitude of sources not only increases the triangulation of data but also supports the external validity and degree of generalisability (Voss et al. 2002). Furthermore, a majority of the aforementioned criticisms of case studies apply to single case studies, as the findings are more likely to be biased by a researcher's subjective perception of a given phenomenon. The risk of misinterpreting events from a single case is also higher due to "exaggerating easily available data, which will be mitigated when data is compared across cases" (Roehrich 2009, p.80).

In line with the objectives of this thesis, the use of multiple case studies allows for better replication of the findings (Yin 2014), which in turn favours the development of richer theoretical frameworks and contributions in terms of theory building (Ellram 1996). The inductive aspect of the present thesis requires the acquisition of rich empirical data to create a robust foundation for future research. Such inductive logic is supported by the use of multiple sources of empirical data (Voss et al. 2002, Patton 2002). All the cases demonstrated shared characteristics to a certain extent that allowed the researcher to classify the individual case firms into four different archetypes of service provision, as is outlined in the forthcoming subsection, rendering an analytical comparison across the multiple cases feasible.

In sum, this thesis follows a multiple case study strategy in order to (1) strengthen the external validity of the study, (2) overcome the lack of generalisability, (3) increase the rigor of theory testing and theory building approaches in qualitative operations management research and (4) obtain deeper understanding and insight into the service provision continuum, which includes regarding multiple constructs within firms' service offerings and integration capabilities.

3.4.2 Case Selection Process for this Thesis

The selection or sampling of case companies is considered as a crucial process in conducting field research. Contrary to positivistic ways of probability sampling, common in survey research, case-based research relies on a purposive sampling strategy, where cases are selected on basis of their potential contribution to a study (Ritchie et al. 2013). The intention of case research is not to generalise to a wide and largely abstract population, as is the goal in survey studies, where a sample serves as the basis for statistical generalisation of a population (Roehrich 2009). Rather, case sampling is based on a researcher's intention to theorise findings in order to build and expand on existing theories or create new ones (Yin 2014).

The appropriate sample size for case research is said to be anywhere between four and ten cases (Eisenhardt 1989b). However there is not a fixed number of cases one should adhere to, rather effective sampling stops when data saturation is reached, i.e. when the research questions are fully addressed and no additional knowledge can be gained by additional interviews or observation (Eisenhardt 1989b, Glaser and Strauss 2009), since "repeated evidence contributes little to the findings of the study" (Roehrich 2009, p.82). Thus more important than the sample size is the selection criteria used to sample the cases (Eisenhardt 1989b, Yin 2014). This involves literal and theoretical replication, which refers to the likelihood of generating similar and contrasting results for predictable reasons (Voss et al. 2002).

The case selection for this research was informed by positioning service firms as different archetypes of service provision. More specifically, the case selection focused on the provider's side of any buyer-supplier relationship within the logistics industry. The purpose of selecting provider firms as the empirical focus in the context of services was to investigate the specific characteristics that providers offer across different supply chains, as is outlined in Table 3.6. Eisenhardt and Graebner (2007) argue that the sampling of extreme cases that represent, for instance, very high and low performing characteristics, furthermore inspired the theoretical sampling approach in this thesis. The authors recommend this 'polar types' approach as it allows for better observing similarities and contrasting patterns.

Table 3.6 provides an overview of the reasoning behind the selection process in this thesis. Prior to the case selection, three different types of supply chains were identified,

including the (1) manufacturing, (2) retail and (3) non-retail service industry. While conducting initial interviews it became obvious that service providers adopt different roles within each of these three supply chain settings. This categorisation of service provision proved instrumental in the data analysis processes, as it served as the basis for the later classification of cases and facilitated the allocation of case firms to the four proposed archetypes of service provision. Going back to the initial multiple case study design, at this case selection stage, firms were purposively selected and allocated to an archetype of service provision following the initial conceptual framework. The type of supply chain the firm operates in (see Figure 3.4) just serves as a mean to better make the initial allocation, which is further described in section 3.4.3. Because the empirical focus of this thesis is on the service providers, it was crucial to compare providers from different supply chains in order to identify a range of similar and contradictory results. The selection of case studies was made, in part, to differentiate service operations logistics transactions according to their contribution to the integration capabilities. But more importantly, it considered the empirical potential of the cases to increase the validity and understanding of the initial conceptual framework.

The different role of the providers can be classified based on their level of integration amongst the three supply chain settings, as is illustrated in Table 3.6. Integration here refers to the downstream and upstream interaction with customers and suppliers, which are classified as (1) supporting activities for manufacturing supply chains, (2) integrating functions in retail supply chains and (3) continuously adapting to customer requirements in service supply chains. These three characteristics reflect distinct roles of the providers as it is also presented in the literature (see Figure 3.4). Hence, providers in the manufacturing industry primarily undertake supporting and external activities; providers in retail supply chains are more integrated within a triadic relationship between producer, provider and end-consumer; providers in non-retail service supply chains act as broker or intermediary with close links to both producers and end-consumers

In sum, standardised outsourcing activities are mainly present in the manufacturing industry; highly integrated relationships are common in the retail industry; and continuously adapted systems are prevalent in service and customer-centric supply chains.

Who is the focal firm?		Service characteristics of provider firm	Role and responsibility of service provider	Provider's relationship with customers	Provider's relationship with end-consumer
<i>Manufacturing Supply Chains</i>	Producer or manufacturer for industrial goods, with solid supplier and customer base.	Standard logistics and outsourcing services, such as transportation, warehousing and packaging.	Supporting role as distributor or transport carrier for material and products.	Short-term contractual relationship, market dyad and day-to-day business.	No close relationship; constantly changing customers regarding the focal firm's requirements.
<i>Retail Supply Chains</i>	Distributor for consumer goods with solid supplier and changing customer base.	Advanced services, such as the provision of distribution network and IT platforms.	Integrated distribution of finished goods to the final customer including inventory control etc.	Long-term contractual relationship, integrated IT system for ordering, tracking and tracing and inventory control.	No contractual relationship with end customers but close communication and information abilities.
<i>Non-Retail Service Supply Chains</i>	Governmental or public institutions; project-based contracts with a changing supplier and customer base.	No owned physical assets; intangible resources, such as human assets, knowledge, patents and strategic collaborations.	Integrated solution across all functions in the supply chain from sourcing to distribution and after sales support.	Strategic collaboration on a long-term basis, integrated IT platforms and contractual arrangements include sourcing, warehousing and distribution processes.	Close relationship with focal firm's customer base through specification of performance outcomes and coordination of operations and processes.

Table 3.6: Reasoning and Characteristics behind Case Selection

The supporting role of service providers in *manufacturing supply chains* represents the lowest degree of integration and customisation. The focal firm is usually a producer or manufacturer of consumer and/or industrial goods with a solid and constant customer and supplier base. Both suppliers and customers have a close relationship with the focal firm regarding purchasing and replenishment behaviour. In terms of services, however, the focal firm only outsources peripheral activities, such as transportation and warehousing. Service providers are thus easily interchangeable and operate in a highly competitive market. The logistics functions of these service providers mainly entail storing and transporting raw material and finished goods. The value-adding factor is very low and these services are primarily judged in terms of their cost to the focal firm. Therefore, price as it pertains to cost-leadership and efficiency strategies, is crucial for the competitiveness of these providers.

Providers for logistics services in *retail supply chains* are fully responsible for the distribution and transportation network as a whole; representing an integrated approach, these providers offer customised services to the focal firm. The focal firm is typically a retailer, selling consumer or industrial goods in different industries, such as food, electronics or equipment and spare parts for commercial or private use. The customer and supplier base is diverse and spread out amongst different industries. Retailers source their products from multiple manufacturers across different geographic locations in order to provide a wide range of differentiated products to their customers. Due to the competitive environment within the retail industry, customers have multiple options for purchasing desired products via different channels, such as online home delivery or shopping from the in-store collection. Customers are the main focus for which retailers structure their strategies, which increases the need for multiple product and service offerings targeted directly to the retailers' customers. The providers for services interact with both the retailers and customers simultaneously and act as an intermediary in the supply chain. Since the providers are responsible for the coordination between channels, i.e. suppliers, manufacturers and the end customers, emphasis is placed on their ability to provide customised and diversified solutions, if they wish to remain competitive.

The continuous adaptation of systems, in particular the logistics function in *non-retail service supply chains* represents the highest degree of customer and supplier involvement and integration from a provider's perspective. The focal firm is either a large organisation

or public institution, such as the government or organisations in the public or non-profit sector. The industry is characterised by rather large-scale and often complex projects, such as the development and construction of wind parks, power plants and hospitals. Emphasis is not on costs or pricing strategies, but rather on quality and time considerations. However, cost still plays an important role in terms of making predictions and forecasts with regard to project planning, insofar as many external stakeholders are involved and customers from both the public and private sectors rely on accurate predictions, given such a high level of investment. Customers therefore tend to be large organisations from various industries that hold the interest of manifold external stakeholders. The provider represents a fully outsourced party that takes over the role of an integrator or orchestrator, whose main responsibility is to coordinate the planning, design and implementation phases of the project. Providers or integrators, in this case, foster a very close relationship with suppliers, customers and stakeholders in order to increase the performance outcomes of the project and strengthen the collaborative relationship. These kinds of projects, such as the construction of a ship, aircraft or power plant involve many different actors, inputs and contractual arrangements. The environment and the external circumstances surrounding such supply chains can be volatile and precarious (e.g. subject to sudden political or regulatory changes). Due to the high investment of funds and external parties, a current and accurate overview of the expected performance outcomes needs to be made readily available at any point during the project. In this way, information technology and integrated communications play a crucial role in the providers' competitiveness.

In sum, the three different supply chain settings relate to the different archetypes of service provision, as they relate to the initial conceptual framework. As is illustrated in Figure 3.4, this served as a starting point for the case selection and allocation process in this thesis, which is further described in the next section.

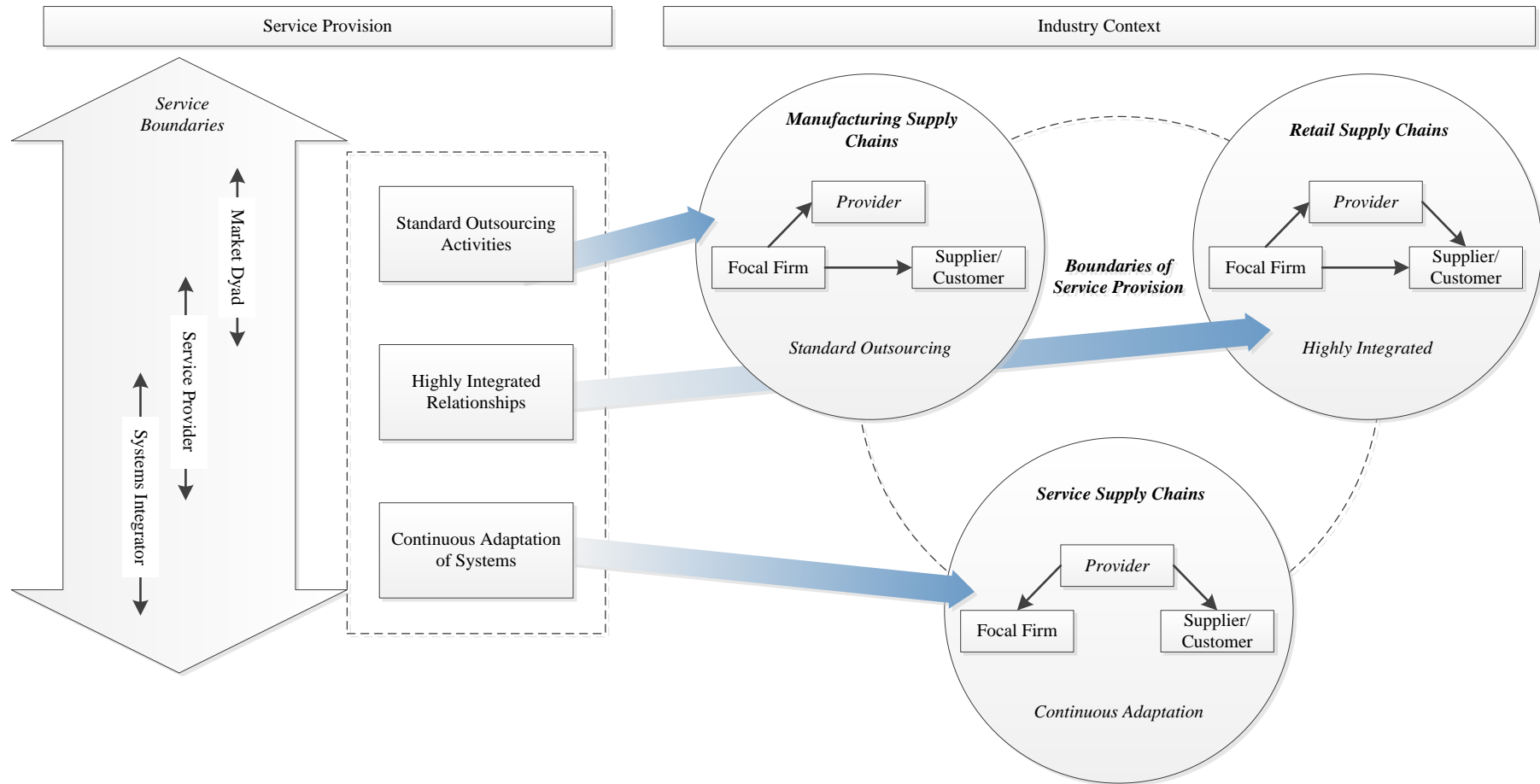


Figure 3.4: Overview and Justification of Case Study Industry Sampling

3.4.3 Selection and Allocation Criteria for Cases in this Thesis

In order to understand the service provision boundaries and investigate the systems integration capabilities across different industries, firms had to meet the following criteria to even be considered as cases in this research. As was previously mentioned and outlined in Table 3.6, this study is interested in three different supply chains, namely (1) manufacturing, (2) retail and (3) non-retail services. Thus, the selected case firms all conduct business in either one of these supply chain settings and possess the associated following additional characteristics. First, based on the definition of small and medium-sized enterprises (SME) in the European Union, firms had to employ at least 10 employees and generate an annual turnover in excess of 10 mn. Euro and/or produce an annual balance sheet totalling to at least 10 mn. Euro. This guaranteed that the case firms were of a minimum size and could contribute, at least to some extent, to the competitive environment in Europe. Second, the scope of the case firms' operations had to exceed its local national market and include other European customers; this excluded those small or micro-level operators that are only active in their local regions. Third, each firm had to have direct contact with customers. Hence, small operators acting as only supporting carriers were excluded, as they do not represent valid service arrangements. Fourth, the case firm had to possess their own physical assets or at least actively offer the provision of asset-based services, which necessitates that ownership of assets is clearly stated; this excluded pure broker agencies that are neither clear nor precise in their service offerings.

The first distinction (Figure 3.7) between manufacturing, retail and service supply chains is related to the different archetypes of service provision, in terms of standard outsourcing activities, highly integrated relationships and the continuous adaptation of systems (as derived from the initial conceptual framework).

Offered Services by Provider	Manufacturing Supply Chain	Retail Supply Chain	Service Supply Chain
<i>Standard Outsourcing</i>	3, 10, 11, 16, 20, 21	3	
<i>Highly Integrated Relationships</i>	12, 22, 23, 15, 4	1, 6, 7, 18, 22, 23, 25, 2, 5, 8, 17, 19, 24	7, 18, 5
<i>Continuous Adaptation of Systems</i>			9, 13, 14

Table 3.7: Provisional Allocation of Case Firms

Based on the initial allocation, case firms 3, 10, 11, 16, 20 and 21 operated primarily in the manufacturing and production industry as service providers. Case firms 1, 2, 5, 6, 7, 8, 17, 18, 19, 22, 23, 24 and 25 mainly served retail customers in a more integrated supply chain setting. And case firms 9, 13 and 14 operated as providers in non-retail service supply chains, in terms of offering entire supply chain solutions to customers across multiple industries. An illustrated allocation of the case firms is presented in Figure 3.6. At this stage of the sampling process, it became clear that as a result of the highly integrated relationships in retail supply chains, the customer base differed from those of manufacturing and service supply chains. This distinction is considered in determining the four archetypes of service provision (see Figure 3.6), where highly integrated relationships (i.e. those operating in retail supply chains) are divided into ‘outsourced’ and ‘institutional’ service providers (see section 3.4.5 for a more detailed definition of the four case archetypes).

Access to the case companies and interviewees was gained through networking with logistics managers and practitioners during several industry symposiums and academic conferences. Amongst others, the exhibitors fair ‘Transport Logistics’, which takes place every two years in Munich, Germany and attracts global and European service providers and logistics firms, facilitated preliminary meetings with practitioners and potential interviewees. Additionally, academic conferences organised by various organisations, such as the Logistics Research Network (LRN), the International Purchasing and Supply Education and Research Association (IPSERA), the International Symposium for Logistics (ISL) and the European Operations Management Association (EurOMA) proved vital in gaining access to qualified firms and organisations, and resulted in valuable feedback during the research process. Finally, referrals and purposively initiated networking and socialising opportunities led to the identification of interesting and relevant firms and interviewees. In this way, the researcher’s personal business and professional networks helped in identifying and meeting potential participants for this study.

3.4.4 The Unit of Analysis for this Thesis

The unit of analysis must relate to and reflect the research questions in such a way that allows the researcher to investigate the phenomenon of interest and respond directly to the proposed research questions (Yin 2014). In a commercial setting or context, case study

research is suitable for analysing relationships or interactions between separate entities or organisations (Dubois and Araujo 2004). The unit of analysis adopted in this study is the ‘service provider’. However, in order to investigate the phenomenon of service provision, its boundaries and systems integration capabilities, the unit of analysis was further divided into four distinct parts. The investigation of four units of analysis in this thesis helped to better understand the service provision boundaries of provider firms in terms of a their (1) capabilities regarding core competences, (2) governance mechanisms, (3) outsourcing arrangements and (4) systems integration as is illustrated in Figure 3.5.

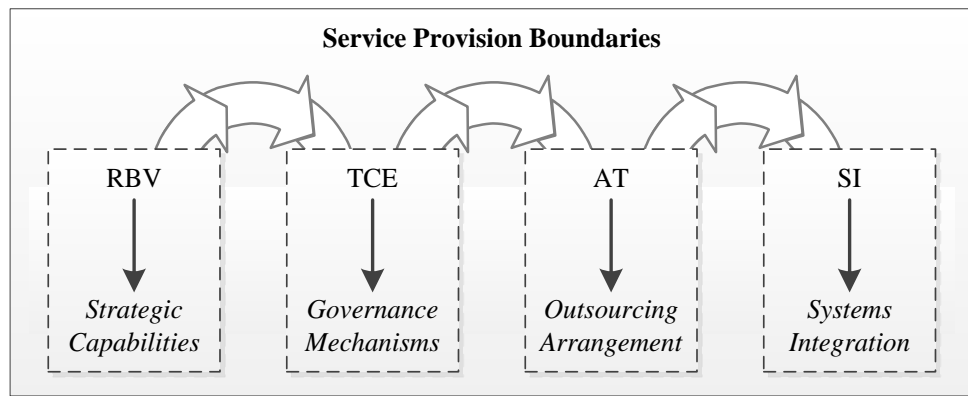


Figure 3.5: Units of Analysis for this Thesis

The four units of analysis served as the dependent variables in this qualitative case study research. The independent variables were represented by the theoretical constructs that were developed from the literature. These units of analysis also represented the basic structure of the semi-structured interview guide, while the theoretical constructs served as the basis for the specific questions (see Appendix B for the semi-structured interview guide developed for this thesis).

3.4.5 Definition of Cases for this Thesis

Drawing on the initial conceptualisation of three types of service provision boundaries (see Figure 2.13) the *a priori* allocation and selection of potential case firms was initiated. Here, the industry context, as described above, was considered and guided the allocation process, following the assumption that provider firms operating in the manufacturing industry mainly conduct standardised and basic services, firms operating in the retail and fashion industry conduct highly integrated services and firms operating in the service industry conduct continuous adapted systems integration. Following this initial selection and allocation process, first interviews with the identified case firms were collected.

These first initial interviews resulted in a further distinction of service provision boundaries, what is later portrayed as the proposed four archetypes of service provision. In addition, these following four archetypes were validated and discussed amongst scholars and practitioners at various conferences.

Figure 3.6, as shown below, illustrates the allocation of 25 distinct case firms to the four archetypes of service provision (as it was derived from the initial conceptual framework), which serves as the basis for the later within-case analysis and cross comparison of service boundaries.

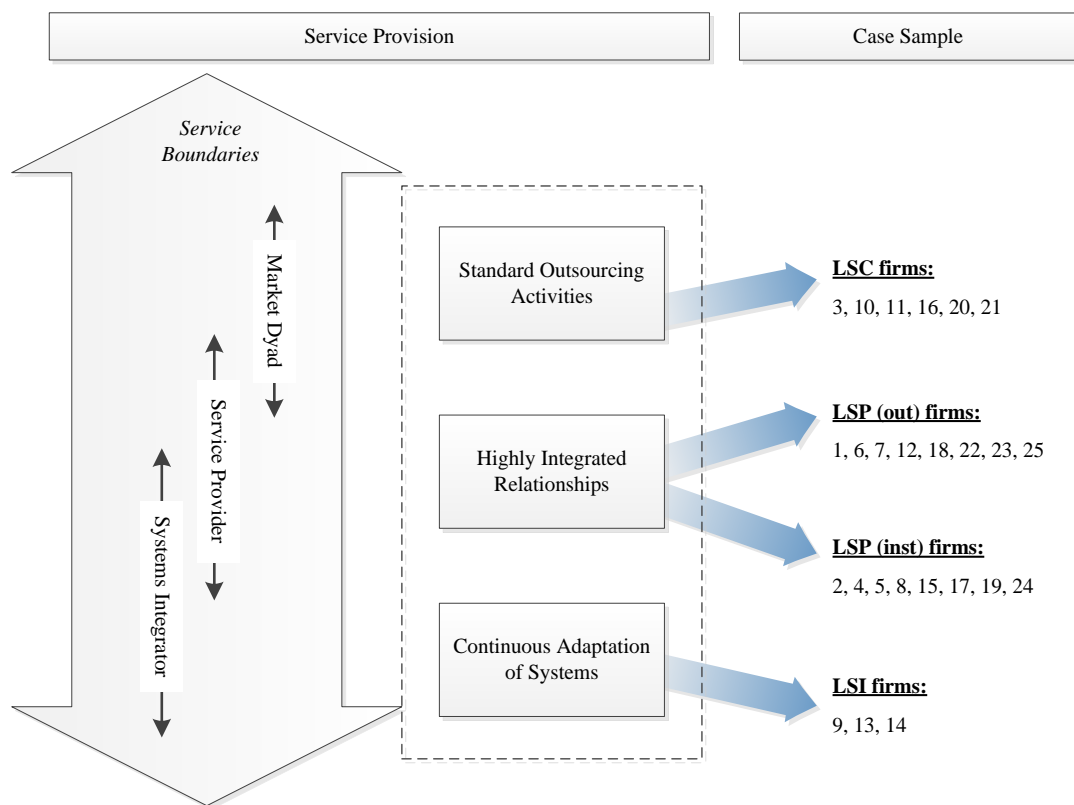


Figure 3.6: Allocation of Sample Firms to Case Categories

3.5 Data Collection Methods for this Thesis

The following section describes and explains the specific data collection methods that were employed in this thesis. The case study process was carried out over a time period of about seven months and included primary data in the form of interviews, field notes, observations, and secondary data from the extant literature in the form of company specific reports, documents and presentations.

3.5.1 Systematic Review of the Literature

The following subsection describes the method used to conduct a systematic review of the literature, which was in response to recent calls to increase the rigour of reviews in management science (Tranfield et al. 2003, Denyer and Neely 2004, Thorpe et al. 2005). Additionally, a systematic literature review is a valid and feasible approach to structuring an academic field (Srivastava 2007). Müller-Seitz (2012) and Bakker (2010) stress the importance of a step-by-step, transparent approach of literature selection. In order to achieve such transparency, the process of selecting relevant journal articles with a focus on service provision and logistics outsourcing is described in detail. The following subsections outline how the pertinent literature was selected using a rigorous search method and how it addresses research question one in terms of the journal articles' focus and contribution to logistics outsourcing.

Selection of Academic Management Journals

Conducting a review of the relevant literature on service outsourcing entailed two main selection criteria. First, the review was limited to double-blind reviewed journal articles in top journals within the social sciences (based on the ABS journal ranking) and in the area of management research. Journal articles, as mentioned by Keupp et al. (2012), have the greatest impact on an academic field are those which have been refereed from other academics and scholars (Ramos-Rodríguez and Ruíz-Navarro 2004, Podsakoff et al. 2005, Ordanini et al. 2008). The second selection criterion involves the focus of the reviewed articles, which is not solely limited to the context of organisational studies, as most management reviews are (Keupp et al. 2012), but also considers the development of outsourcing knowledge as it pertains to focal firms, providers of services and customers.

The selection of relevant academic articles was based on an evaluation of the quality of journals in the fields of purchasing and supply management. As was previously stated, logistics and service outsourcing is an integral part of supply and operations management, which also has the capacity to contribute to different academic disciplines. Zsidisin et al. (2007) apply a multiple-scale item and factor analysis methodology to evaluate the quality, reputation and relevance of journals amongst purchasing and supply chain academics and scholars. Their list includes journals directly linked to the purchasing and supply management field, but also recognises strategic and operations management

disciplines. Building on this approach, the systematic literature review undertaken in this study is limited to 27 identified core journals. However, the final keyword search within these 27 journals only resulted in a hit in a total of 17 journals, that then were included: *European Journal of Operational Research* (EJOR), *IEEE Transactions on Engineering Management* (IEEE), *Industrial Marketing Management* (IMM), *Interfaces* (INT), *International Journal of Logistics Management* (IJLM), *International Journal of Operations and Production Management* (IJOPM), *International Journal of Physical Distribution and Logistics Management* (IJPDL), *International Journal of Production Economics* (IJPE), *International Journal of Production Research* (IJPR), *Journal of Business and Industrial Marketing* (JBIM), *Journal of Business Logistics* (JBL), *Journal of Operations Management* (JOM), *Journal of Purchasing and Supply Management* (JPSM), *Journal of Supply Chain Management* (JSCM), *Journal of the Operational Research Society* (JORS), *Omega*, and *Supply Chain Management: An International Journal* (SCMIJ).

Subsequently, the academic orientation of the relevant 17 journals were identified and categorised based on their relation to (1) Logistics and SCM, (2) General Management, (3) Operations Management and (4) Operations Research. The association of business schools' (ABS) journal ranking was used as a guide in defining these four major categories (see Table D.7 for the classification of the relevant journals to the management research categories).

Selection of relevant Outsourcing Articles

Figure 3.7 illustrates a four-stage refinement process proposed by Bakker (2010) that was applied to identify the relevant journal articles in this research. Consistent with prior search approaches (Seuring and Müller 2008) a keyword search was conducted containing the words and/or phrases in the title, abstract or full text; these included 'logistics', 'supply chain', 'SCM', 'outsourc*', 'make-or-buy', 'third-party*' and '3PL'. The search strings were applied individually and in combination, which generated a list of 523 articles (an initial search across all journals and disciplines from the online databases resulted in 3,944 hits) over the period of 2003 to 2013. Next, as is described in the following section, a narrowing of the search over four stages totalled to 119 papers, which served as the basis for analysis of service outsourcing literature in management journals (see chapter one for the summarised findings stemming from this search

process). The online databases that were used to access journal articles included *ScienceDirect* (Elsevier), *Emerald Insight* (Emerald) and *Business Source Premier* (EBSCO).

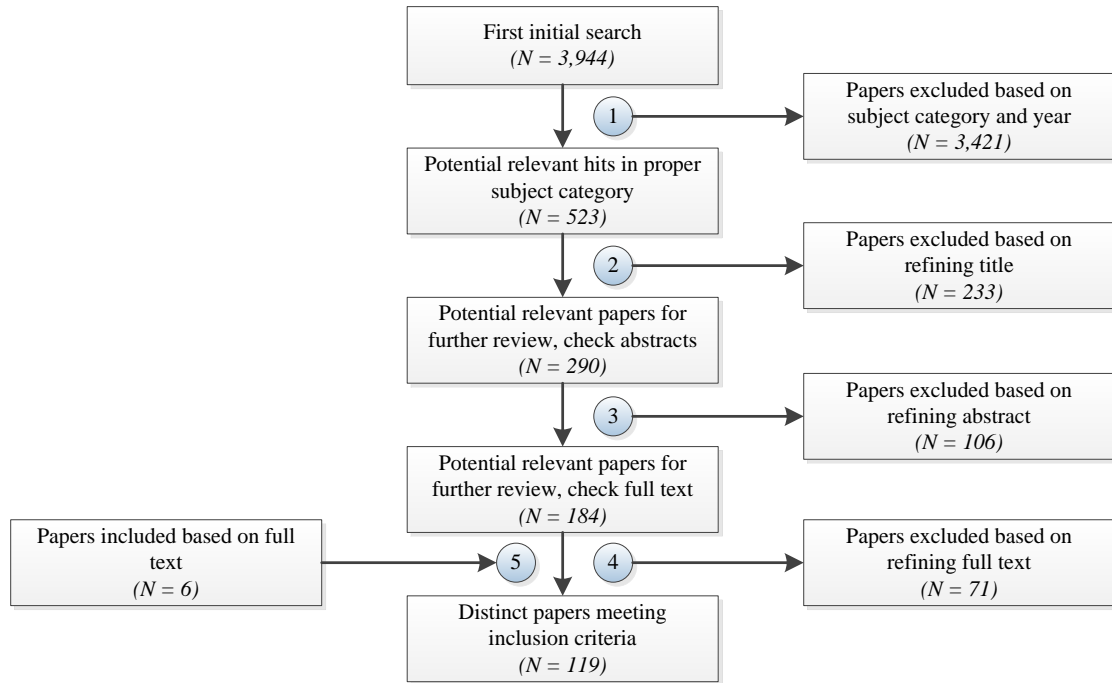


Figure 3.7: Flow Diagram of Literature Refinement Process

Source: Adopted from Bakker (2010).

Narrowing the Research Focus

The inclusion and exclusion criteria for narrowing the 523 identified journal articles were based on the author's prior experience, knowledge and understanding of outsourcing practices. In addition, the context and the units of analysis were considered. First, only those studies that dealt with the subject of outsourcing activities and the governance or management of third-party relations were included. Similar to Zsidisin et al.'s (2007) approach to journals, articles that were published in journals that do not meet the predefined understanding or criteria, i.e. journals focusing on accounting, computer modelling, consumer marketing, computer sciences or human resources, were excluded. Second, studies were excluded that did not explicitly focus on service outsourcing or third-party related issues in their title. This second step eliminated 233 out of the 523 identified papers, given their focus on peripheral topics, such as the outsourcing of information systems and human resource management, to name a few. Notably, studies on supplier or buyer performance were not considered either. Third, a similar review of

the remaining 290 papers' abstracts resulted in the exclusion of 106 papers. These articles fell out of the scope of this research and considered, for example, productivity effects of outsourcing, innovation research, maintenance services, vendor strategies or operational inventory control. Fourth, following the first three steps, 184 potentially relevant papers that meet the predefined inclusion criteria were carefully reviewed and classified, according to the criteria that were generated based on the theoretical constructs. From this, another 71 papers were eliminated, insofar as they were deemed unsuitable to address research question one and/or objectives of this research. As a final step, some relevant articles (6 papers) located in the reference lists of some of the remaining papers were included, resulting in a total of 119 articles, which accordingly, comprised the systematic literature review.

Designation of Knowledge Type

The descriptive analysis of the identified 119 papers involved categorising the articles based on their empirical versus theoretical focus. Empirical studies, which can be further divided into quantitative and qualitative types, sometimes collect multiple sources of data collection and implement a multiplicity of methods. Therefore, for simplification, each paper was assigned to only one category (i.e. quantitative or qualitative), based on its main approach and/or contribution. This decision was based on the researcher's judgement, who individually classified the papers and compared the results. In a few instances, the opinion of an external reviewer was required in order to adjudicate a particular classification. The theoretical papers were divided into normative or descriptive approaches; again, this resulted in some overlap. Descriptive reasoning could, for example, be inspired by normative questions and vice versa. In a few cases, where theoretical reasoning inspired empirical studies, the dominant approach was chosen, based on the originality of the relative paper's contribution.

3.5.2 Semi-Structured Interview Process

Semi-structured interviews were held with key informants from selected service firms and comprised the majority of the case study data. Each case was constructed based on the interviews from employees holding a managerial or C-level positions in the firm, which included logistics, supply chain and/or transportation responsibilities. Interviews, as a means of data collection in case study research, are said to be the single most

important source of evidence (Eisenhardt and Graebner 2007, Yin 2014). Furthermore, semi-structured interviews have been acknowledged as a useful means of data collection in OM research (Walker 1985, Denis et al. 2001, Bingham and Davis 2012) and in particular, for case research (Stake 2013). Consequently, they are instrumental in this thesis for generating insight (Kavale 1983) into the phenomenon of service provision.

For the purpose of this thesis, interviews were arranged and scheduled with key informants from service firms via an initial e-mail or telephone call. In some cases, personal referrals helped in setting up interview meetings that were mainly conducted face-to-face or on some occasions, via Skype or telephone. An interview guide, along with pre-set questions, was established based on the initial conceptual framework and the identified constructs stemming from the literature review. These constructs served as a starting point for an in-depth discussion. A mix of open-ended and conceptual questions allowed the researcher to thoroughly explore the topic of interest. All questions were asked in a sequential and consistent order, however, the interviews also incited additional avenues of interest, as was more or less expected (Berg et al. 2004). Hence, the discussion and interview process allowed for further areas of interest to be raised and explored that were not initially considered in the conceptual framework, which also necessitated the researcher to go ‘off-script’ (Brewerton and Millward 2001). This process, however, still required the interviewer to make certain judgement calls about the direction of the interview (Patton 2002), in order to remain focused on the overall research aims and objectives. In sum, all interviews adhered to a comprehensive interview guide (see Appendix B), but allowed for clarifying as well as open-ended questions and more general discussion towards the end of the interview.

In total, 30 interviews that lasted between 40 and 90 minutes were conducted over a period of ten months. Appendix C represents the detailed record of fieldwork undertaken for this thesis. The use of a tape recorder was employed in most cases, insofar as it has been said to reduce researcher bias (Voss et al. 2002). Notably, some of the interviewees did not agree to be recorded, due to confidentiality issues. In those instances, more detailed notes were taken. On a similar note, one limitation of semi-structured interviews is that, as is the case with most interviewing techniques, each discussion is a biased and co-created discussion between the interviewee and the interviewer (Lee 1999). There is an additional concern that participants passively or even expectedly respond to questions based on what they feel might be expected from the researcher (Kavale 1983). This would

indicate that respondents are influenced and biased towards finding the supposed ‘right’ answer (Denscombe 2014, Gomm 2008), which may not represent the authentic nature of their beliefs and thus distort the phenomenon of service provision.

3.5.3 Credibility and Quality of the Research Design

The quality of empirical social science research is commonly evaluated on four criteria that represent its validity and reliability (McCutcheon and Meredith 1993, Denzin and Lincoln 2009, Yin 2014). Table 3.8 summarises how the criteria of ‘construct validity’, ‘internal validity’, ‘external validity’ and ‘reliability’ are accounted for.

Criteria	Purpose	Phase	Actions taken
<i>Construct Validity</i>	Establish correct operational measures for the constructs under study	Data collection	Developed interview guide based on literature Initially tested and piloted protocol Use of multiple case study design (4 cases) Informants’ validation of case study reports
<i>Internal Validity</i>	Establish causal relationships and distinguish them from spurious relationships	Data analysis	Multiple cases per archetype Cross-case comparison in search for patterns
<i>External Validity and Generalisability</i>	To establish the domain in which the research can be generalised	Research design	Multiple case study design Purposively sampled cases covering various industries ranging from commodities through to complex fashion and retail products
<i>Reliability</i>	To demonstrate that the study can be repeated with the same results	Data collection	Documented and validated case study protocol Production of transcripts Coding of interview transcripts Creation of case study database

Table 3.8: Summary of Research Credibility

Source: Synthesised from Yin (2014) and adapted from Selviaridis and Norrman (2014).

Furthermore, and in order to increase the research credibility, data triangulation was achieved by collecting and combining additional documents, such as company presentations, observation notes, company reports, and balance sheets, if they were provided by the legal company registry.

3.6 Data Analysis and Interpretation Methods for this Thesis

The following sections describe and explain the analysis methods that were applied in this thesis. Figure 3.8 outlines the data analysis processes as an iterative approach, as was proposed by Miles and Huberman (1994). They propose an iterative process of collecting

and analysing data by constantly transforming fieldwork into notes and comparing those notes to theory and extant literature. Coding schemes were developed throughout the data collection process, helped to fill in any gaps or ambiguous findings and address any unanswered research questions. The processes, therefore, should not be seen as separate but as one iterative phase, where data collection and data analysis interconnect and overlap. The four iterative phases included (1) transcribing field notes, (2) coding and preparing qualitative data, (3) summarising and displaying findings and (4) drawing conclusions from analysis as it adheres to the initial conceptual framework. The analysis of qualitative data is consistently grounded in the philosophical stance of critical realism (Roehrich 2009).

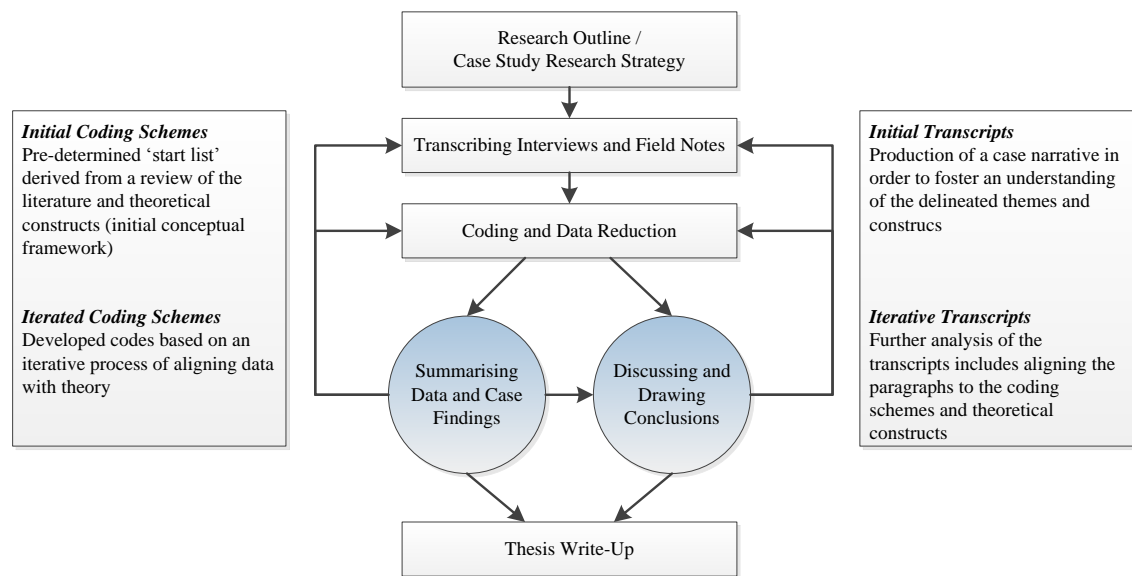


Figure 3.8: Iterative Data Analysis Process

Source: Modified from Miles and Huberman (1994) and adapted from Roehrich (2009).

3.6.1 Within-Case Analysis

The within-case analysis in this thesis presents raw data in a rather descriptive nature and attempts to locate delineated constructs within each proposed archetype (i.e. case). Following the aforementioned four steps, the transcribed field notes and interview recordings were coded and summarised based on the initial conceptual framework. For confidentiality reasons, the names and contact details of the interviewees and firms were anonymised and assigned numerical values. Hence, the later analysis and quotes refer to Interviewee 1, 2, 3...30, respectively. Table C.1 in Appendix C outlines the allocation and categorisation of interviewees to the four archetypes of service provision.

The case findings (see chapter four) present the data for each of the four service archetypes, which reflects the theoretical constructs derived from the initial conceptual framework, including ‘strategic capabilities’, ‘governance mechanisms’, ‘outsourcing arrangements’, and ‘systems integration capabilities’ for each of the four case archetypes. Figure 3.9 illustrates the four main theoretical constructs (i.e. those with the dotted border) that were applied to each of the four archetypes of service provision (i.e. those with the solid border): LSC firms, LSP (out) firms, LSP (inst) firms, and LSI firms, within the context of service provision.

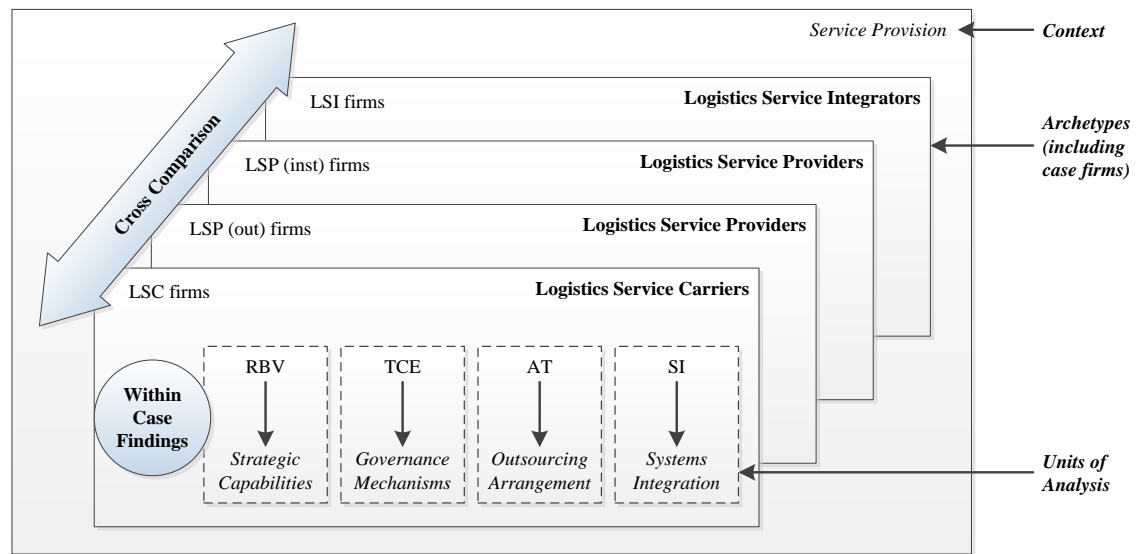


Figure 3.9: Overview of Case Study Analysis Process

Coding allows the researcher to prepare and organise information by reducing data into separate categories and themes (Miles and Huberman 1994, Rubin and Rubin 2011). Due to the iterative nature (going back and forth between theory and data) of this thesis (Figure 3.8), codes and constructs were developed in stages, while reading and analysing the transcripts (Robson 2002, Glaser and Strauss 2009). During the coding process, prepared data was categorised and allocated to the constructs from the initial conceptual framework and amended accordingly. The coding procedures were repeated after two months in order to increase the reliability of the results. Furthermore, the coding process was not facilitated by any computer-based tool or software, but conducted manually in terms of a template analysis (Miles and Huberman 1994). Table E.2 in Appendix E presents an abstract of the coding process of interview responses. Subsequently, findings from the preceding coding and analysis process were presented in a table, which summarised the enablers and barriers of each construct for each of the four archetypes and represents the

findings of the within-case analysis. At this point, the initial evaluation of the individual constructs for each archetype were outlined and were later compared to one another during the cross comparison of the four archetypes.

In sum, the within-case analysis, which included coding, identifying relevant constructs, evaluating constructs and finally, displaying the data, resulted in four narratives that describe the characteristics for each proposed archetype of service provision.

3.6.2 Cross Comparison of Cases

In order to highlight similarities and discrepancies amongst the four identified case archetypes of service provision, a comparison across the archetypes was employed. Cross comparison, for the purpose of this research, was based on the findings from the case narratives, which allowed for the comparison of each individual construct of the different archetypes, based on their relative importance or impact. Hence, this process evaluated the relevant constructs based on a relative scale following a comparative presentation. Additionally, the cross comparison increased the external validity and improved the generalisability of the present study by identifying patterns and trends between the investigated case firms (see Eisenhardt and Graebner's (2007) 'polar types' approach). Emphasis was placed on findings that represented contradictory behaviour of service firms that were not predicted or expected based on the theoretical assumptions outlined in the initial conceptual framework. Figure 3.9 illustrates how the different constructs regarding 'strategic capabilities', 'governance mechanisms', 'outsourcing arrangement' and 'systems integration capabilities' were compared across the four different archetypes of service provision, i.e. LSC firms, LSP (out) firms, LSP (inst) firms, and LSI firms.

3.7 Summary of Research Methodology for this Thesis

This chapter has outlined the philosophical and methodological perspectives adopted in the present study. Critical realism serves as a paradigm and supports the researcher's understanding of accepting and transforming knowledge based on a socially constructed reality within a certain context. The selected research strategy of using a multiple case study is described alongside the data collection and analysis techniques. The quality of this thesis is supported by its research credibility in terms of its validity and reliability. The narratives (i.e. case findings) that resulted from the within-case analysis are presented in chapter four. The cross comparison is presented in chapter five.

CHAPTER FOUR:

WITHIN-CASE ANALYSIS OF SERVICE PROVISION

The purpose of this chapter is to present the development of a proposed service provision continuum based on the description of four archetypes of service provision. The initial conceptual framework inclusive of the theoretical constructs outlined in the literature review guided such description. Accordingly, the chapter presents the findings of the multiple case study, including the 30 interview responses of the 25 investigated service firms. The findings are presented via a content analysis, whilst addressing research question three:

Research Question Three: *How do provider firms within different archetypes of service provisions exploit their idiosyncratic and individual capabilities?*

In this way, this chapter reveals the capabilities and transaction specifications that enable service firms to successfully organise their operations. The findings also highlight that within each archetype of service provision the firms demonstrate idiosyncrasies. It is worth noting that the continuum is not a longitudinal representation of the firms (i.e. changing behaviour over time), but is rather derived based on overlapping characteristics across the four archetypes. This cross comparison, however, is further analysed and explained in chapter five. As was previously described in the methodology chapter (see section 3.6.2) this thesis adopts a multiple case study design. Such an approach, as it is employed in this thesis, allows the researcher to categorise a collection of firms into different categories (i.e. archetypes) focusing on different dimensions of service provision, whilst the unit of analysis remains the service provider firm. The following within-case analysis therefore synthesises the interview data into four different archetypes of service provision (Kowalkowski et al. 2015). The four archetypes (as derived from the initial conceptual framework, see 2.8.2) emerged both from the review of the literature and the empirical data itself. Furthermore, the archetypes and the initial conceptual framework were validated by practitioners (during interviews) and by academics and experts (at conferences).

The approach of categorising service firms has been used before in a similar context of logistics services (Cui and Hertz 2011). However, this thesis extends and redefines the widely accepted three category typology⁴⁰ and introduces the following four archetypes of service provision, (see Figure 3.6 for the allocation of case firms to the archetypes of service provision) as they relate to the initial conceptual framework (Figure 2.13).

1. Logistics Service Carriers (LSC) undertake the simplest form of logistics transactions and activities.
2. Outsourcing Logistics Service Providers (LSP out) offer more advanced services beyond standard transportation and storage activities.
3. Institutional Logistics Service Providers (LSP inst) offer more integrated and complex services and processes.
4. Logistics Service Integrators (LSI) represent the highest form of complexity and interconnection across different partners, associated providers and customers in multiple supply chains, considering the material, financial and information flow.

Indeed, this thesis proposes that these archetypes offer a more refined understanding of service boundaries and contribute to the development of the proposed service provision continuum. Figure 3.6 presents an overview of how the investigated 25 case firms were allocated to one of the four archetypes of service provision. As was outlined in the previous chapter, initial interviews with key informants from the case firms and comprehensive discussions with scholars at conferences helped to justify these four archetypes, which served as the basis for the development of a service provision continuum. Following the allocation of case firms to the four archetypes, the within-case analysis evidences fluctuations and idiosyncrasies as they pertain to the theoretical constructs, within each of these archetypes.

Assessment Criteria for Archetypes of Service Provision

The following subsections describe the characteristics for each service archetype, as they relate to the theoretical constructs of strategic capabilities (RBV), governance mechanisms (TCE), outsourcing arrangements (AT) and systems integration capabilities

⁴⁰ Cui and Hertz (2011) offer a common approach of distinguishing between carriers, intermediary firms and 3PL providers; they classification typifies much of the current research on logistics services.

(SI), as was explained in the methodology chapter. The formulation of each archetype was supported by information collected through the interviews and any additional archived documents made available to the researcher; the specific characteristics of each archetype are summarised in a table presented at the end of each relevant subsection. Each archetype was evaluated individually based on the theoretical constructs in order to present the variations within each archetype. This evaluation was based on a relative assessment of the interested constructs, e.g. from very low to very high. Furthermore, the within-case analysis also serves as the basis for the later cross comparison of the archetypes discussed in chapter five.

Drawing on the theoretical constructs outlined in the literature review (see Table 2.8, Table 2.9, Table 2.10 and Table 2.11 in section 2.8.1 for a detailed explanation of the theoretical constructs and their relative components/items), four assessment criteria were identified as the following: (1) strategic capabilities, (2) governance mechanisms, (3) outsourcing arrangements and (4) systems integration capabilities; these assessment items are further summarised in Table 4.1. It is worth noting that the original constructs (or themes) from the literature served only as a starting point for the iterative coding and interview analysis process. The interview guide followed these initial themes very closely. After transcribing and coding the first few interviews, the initial themes developed into applicable constructs that were more in line with this study's aim to explore the phenomenon of service provision in the logistics industry. Where the assumptions in the literature were very broad and general, the coding and analysis process worded to narrow each construct and helped to identify the specific application of each theme to the delineated and specific context, as explained below.

'Strategic capabilities' draw on both the *tangible* and *intangible* assets that are available and accessible to a service firm, regarding the assumptions of RBV theory about exploiting a bundle of resources. Tangible resources, such as physical assets and peripheral equipment were evaluated based on their ease of accessibility and exploitation. Intangible resources, representing relational capabilities, industry knowledge or know-how and organisational capabilities, were evaluated based on the level of integration with customers and end-consumers (i.e. relational), the range of experience (i.e. knowledge and know-how) and the organisational structure and culture of a firm (i.e. organisational).

‘Governance mechanisms’ draw on the antecedents that are explained following TCE theory. Uncertainty, frequency and asset specificity of transactions impact the nature of outsourcing relationships from arm’s-length dyadic relationships (i.e. market) to integrated relationships (i.e. hybrid) to long-term collaborative relationships (i.e. hierarchy). Furthermore, additional costs and efforts inherent of relational or contractual arrangements within an outsourcing relationship, including negotiating, monitoring and/or switching costs, were assessed.

‘Outsourcing arrangements’ draw on the theoretical assumptions of AT that are related to service outsourcing and focus on the provider firms’ opportunistic behaviour. Goal incongruences, information asymmetry, adverse selection and moral hazard were assessed based on the level of risk propensity and willingness to share information. In addition, tendencies towards behaviour- or outcome-based contracts were critical determinants in assessing the four archetypes of service provision.

‘Systems integration capabilities’ relate to the ability to adapt to market changes and continuously accommodate changing customer behaviours. Drawing on the servitisation literature, firms tend to integrate the provision of products and services to an extent where they can better serve the customer and be closer (downstream) to the end customer. Hence, the provider firms’ systems integration capabilities were assessed based on their ability to develop products, service and systems (PSS), adapt to market changes and interact with customers and/or end-consumers.

Each archetype was developed based on the individual themes, which were evaluated based on the evidence derived from the interviews and case observations made during the data collection process. The evaluation logic represents the relative importance of the constructs for each archetype, respectively. Hence, a logical process of relative scaling was carried out using empirical data as well as the researcher’s knowledge and insight gained through conducting a thorough literature review and holding initial interviews that constitute the empirical data.

Assessment	Strategic Capabilities (RBV)	Governance Mechanisms (TCE)	Outsourcing Arrangement (AT)	Systems Integration Capabilities (SI)
<i>Very High</i>	<ul style="list-style-type: none"> Providers possess their own logistics assets, such as vehicle fleets and warehouses; they typically own unique and rare equipment. Collaboration with other providers is guaranteed through long-term relationships; the firm's organisational culture and structure shows uniqueness. 	<ul style="list-style-type: none"> Transaction specificity is very high and infrequent in nature. Also, predictability is very difficult to assess, which results in highly integrated relationships with customers. Pre-contractual costs for negotiation are high due to the specification of performance outcomes. Monitoring is difficult due to complex network structures and a multiplicity of partners involved. 	<ul style="list-style-type: none"> High availability of information and willingness to share data reduces the level of goal incongruences. Customers and providers know each other's needs and capabilities. Little room for opportunistic behaviour due to close behaviour-based relationships. Purely behaviour-based relationships assumed. 	<ul style="list-style-type: none"> Continuous and close relationships between providers, customers and end-consumers. Providers only offer ready solutions to customers, including after sales services. Providers take over responsibility for most of the supply chain functions, such as procuring and delivering.
<i>High</i>	<ul style="list-style-type: none"> Providers have little or no privately owned assets but have access and can easily exploit subcontractors' resources that are unique and specialised. Owned assets are not unique and easy to imitate. Collaboration with other firms occurs to a certain extent, when the focal firm can benefit from advanced treatment, such as good partnerships. 	<ul style="list-style-type: none"> Transactions are infrequent but easy to predict, which involves less integrated relationships. Monitoring costs are still high due to the collaboration with multiple partners and customers. Therefore, switching providers is difficult and costly 	<ul style="list-style-type: none"> Providers and customers have similar goals that contribute to the improvement of the supply network. Providers are transparent and offer their solutions to only a few big customers, however, retailers remain in control of the end-consumer interaction. Information is shared in order to reduce opportunistic behaviour. 	<ul style="list-style-type: none"> Providers are highly connected with few customers and undertake major supply chain functions. However, control of end consumer interaction remains with the customer. Offered services range from organising distribution and after sales services.
<i>Low</i>	<ul style="list-style-type: none"> Providers have no privately owned assets and can only access and exploit commonly available market resources. Exploiting specialised equipment and scarce resources is possible, but only granted for loyal and/or large customers, due to high costs. Firms implement a market structure, including functional areas, such as marketing and sales 	<ul style="list-style-type: none"> Transactions are mostly standardised and easy to implement in a focal firm's supply chain operations. Monitoring is easy, as performance outcomes are clearly stated prior to the contractual relationship 	<ul style="list-style-type: none"> Providers tend to behave opportunistically and address a wide range of different customers, limited to few industries. Providers have access to all relevant data, but are only willing to share basic information. Contractual basis is short and dyadic 	<ul style="list-style-type: none"> Providers mainly focus on the provision of distribution and replenishment services. After sales or any other communication or interaction with end-consumers is not applicable.
<i>Very Low</i>	<ul style="list-style-type: none"> Providers have no direct access to assets and have no opportunity to access or exploit external resources. Exploiting rare and valuable resources is only possible with a huge amount of effort and investment. The firm is poorly organised into functional areas and has no clear strategic vision. 	<ul style="list-style-type: none"> Transactions are highly standardised, very predictable and require few specifications. Monitoring is easy or not necessary at all, as firms solely engage in arm's-length relationships. Switching providers is common. 	<ul style="list-style-type: none"> Providers are not willing to share any data with any customers or buyers of their services. Information asymmetry is very high due to serious goal incongruences. Highly outcome-based relationships. 	<ul style="list-style-type: none"> Providers only provide products in terms of logistics services, such as single transportation and storing capabilities.

Table 4.1: Assessment Criteria for Theoretical Constructs of Service Provision

4.1 Logistics Service Carriers

The following subsections focus on the empirical evaluation of the LSC archetype that represents the lowest level of integration, namely, the standard outsourcing market dyads. Two legally independent parties (Mol et al. 2005), that is, a buyer and a supplier, usually follow an ‘arm’s-length’ contract as a result of an outsourcing decision from the focal firm (i.e. the buyer). Logistics service carriers (LSC) that engage in such pure dyadic relationships represent an amalgam of the case firms **3, 10, 11, 16, 20** and **21** from the investigated sample of logistics firms. These LSC firms mainly serve manufacturers and producers of industrial and consumer goods. For this archetype of service provision, logistics services place less emphasis on strategic operations and are characterised by low transaction specificity; activities include simple transportation and warehousing, for example. It is generally assumed that these types of services provide a supporting role to the focal firm’s (i.e. buyer’s) supply chain. Table 4.2 summarises the firms allocated to the archetype of LSC service provision.

Firm No.	LSC Service Provision Characteristics	Fixed Assets / or (if available) Revenue in EUR p.a.
3	Transportation and storage of general cargo; mainly full truck loads; partially subcontracted to carriers. Customer base consists of manufacturers and producers in the FMCG industry.	60 privately owned HGVs; local warehouse for palletised and chilled products; one national branch. Annual Revenue 7.5 mn.
10	General cargo, FTL and LTL shipments, frequent line haul services between Germany and France. Customer base consists of industrial manufacturers in the steel and heavy goods industry.	150 privately owned HGVs; one local warehouse for bulk storage; four national branches. Annual Revenue 24.0 mn.
11	Organisation of heavy load cargo includes transportation and storage of components for power plants and windmills. Customer base in the steel industry, which consists of small and medium sized corporate enterprises.	40 privately owned HGVs; specialised carrier equipment; one local warehouse for bulk storage. Fixed Assets 1.0 bn.
16	Heavy load cargo; one-off and recurring projects of organising construction sites. Customer base consists of industrial organisations that build power plants, windmills, railway systems, steel constructions and/or steel engineering.	100 privately owned vehicles; specialised for heavy load cargo; 20 European branches. Annual Revenue 40.7 mn.
20	General Cargo, FTL and LTL transportation and storage services. Customer base consists of industrial manufacturers in the agricultural industry.	Twelve national warehousing facilities; >100 privately owned HGVs. Annual Revenue N/A
21	Transportation of general cargo; FTL and LTL transportation; provision of export packaging for dedicated customers. Customer base consists of local manufacturers and producers of consumer goods.	15 privately owned HGVs; one local national warehouse. Annual Revenue N/A.

Table 4.2: Case Firms’ Characteristics for LSC Service Provision

As is evident, the six investigated firms possess similar characteristics in terms of their tangible and intangible capabilities, their customer base, relational governance form and the level of interaction with customers and end-consumers, as exemplified by the following excerpt: “We are a pure medium-sized logistics firm [...] founded more than 20 years ago. [...] We offer simple transportation and warehousing services to our customers [and] we do not offer any sea freight, air freight [...] or contract logistics [services]” (LSC Interviewee 10). The following Figure 4.1 summarises each case firms assessed characteristics within the LSC archetype of service provision.

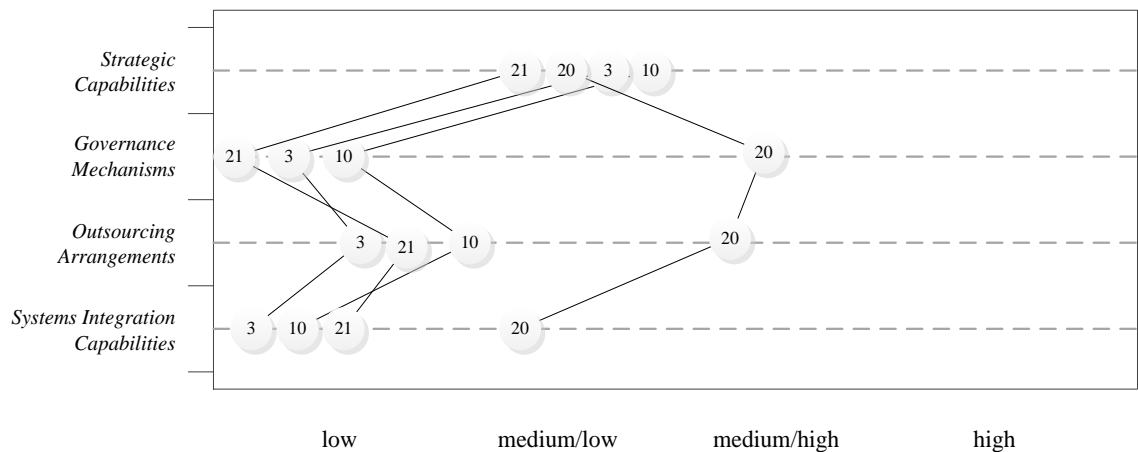


Figure 4.1: Empirical Evaluation of LSC Service Provision

The following subsections present the case study findings via the analysis of interviews from six LSC firms, regarding their strategic capabilities, governance mechanisms, outsourcing arrangements and systems integration capabilities. Furthermore, Figure 4.1 summarises each of these empirically evaluated constructs as they pertain to the LSC archetype of service provision.

4.1.1 Strategic Capabilities for LSC Service Provision

The primary items contributing to the construct of strategic capabilities for service provision within the archetype of LSC firms are physical assets and, to a lesser extent, relational capabilities. A highly competitive environment forces LSC firms to build strong customer relationships by offering specialised equipment and assets to their customers. However, their primary emphasis is on economies of scale and operational efficiency in terms of increasing asset utilisation. Emphasis is placed on relational rather than contractual governance, meaning, their relations are characterised as being short-term and non-contractual in nature (as is explained below). The unique selling point for LSC firms

seems to be the cost-effective provision of standardised and basic logistics activities. It is very easy to switch suppliers within this market segment, insofar as specificity of transactions is low. Consequently, LSC firms place very little importance on developing their strategic capabilities, as is supported by the following items.

Physical Assets for LSC Service Provision

Amongst all LSC firms, a privately owned vehicle fleet and simple warehousing facilities represent the most important assets required to conduct logistics operations on behalf of their customers. The interviews revealed that it is very important to maintain and exploit these privately held resources as much as possible.

Just recently, I talked to other logistics firms at an event, and generally, the perception amongst all of them is to ideally have an updated and rather new vehicle fleet (LSC Interviewee 3).

Case firms 3, 10, 11 and 21, for instance, actively developed their physical assets over time by acquiring basic resources, which allowed them to grow in an organic manner.

Over time, we expanded our vehicle fleet from five or six trucks in the beginning, to 40. Today we have 30 vehicles for conventional transportation and ten vehicles for heavy cargo shipments (LSC Interviewee 11).

Such explicit focus on asset ownership suggests that, on the one hand, LSC firms are very limited in exploiting capabilities across the market. On the other hand, this allows them to emphasise customers' individual requirements in terms of meeting specific regulations or acquiring certifications, for instance. LSC Interviewee 10 states that "we have a relatively modern vehicle fleet [...] because shippers are more and more [environmentally] cautious about that". Consequently, LSC firms fully exploit their own assets but also rely on external assets when they occasionally borrow them.

We make an effort to conduct most of our business with our own equipment. However, for bigger projects, such as a two-day transportation, we hire additional subcontractors. But we conduct 75% to 80% of the transports with our vehicle fleet (LSC Interviewee 11).

This level of exploitation, however, only applies to commonly accessible resources, such as heavy goods vehicles (HGV) or warehousing space. And LSC firms generally offer equipment that can be easily imitated or substituted by other competitors. Therefore, LSC firms seemingly only utilise basic resources specifically and "according to the customer

requirements, [they] adjust [their] assets [and equipment] in order to serve a certain market” (LSC interviewee 11).

Relational Capabilities for LSC Service Provision

Most LSC case firms tend to engage in short-term and non-contractual relationships with their customers. In this case, strong relationships are based primarily on trust and entail rather basic and simple nature of service exchanges. LSC firm 11, representative of all other firms within the LSC archetype, supports such behaviour.

We usually have an agreement, but even with corporate enterprises, the relationship is based on *verbal agreements*. [...] Our operations represent only a small part of the bigger picture, [for example], when [our customer] builds a power plant (LSC Interviewee 11).

In the case of LSC firm 21, mutual trust has been established through a long-term and close exchange of employees and staff (not through a long-term contract). In a similar vein, LSC firm 3 experiences such treatment from its customers.

We typically do not have a contractual relationship with our carriers [...] and it is mainly based on trust and relational capabilities. And every day we experience, if you do a good job, you can rely on your partners. Even though there is no contract, you can expect the same shipments every day (LSC Interviewee 3).

These are two examples of how small-scale carriers can increase their relational capabilities. However, such exploitation of relational capabilities in the form of trust contradicts the literature, i.e. the development of long-term trust was not expected based on the assumptions of provider opportunism.

In sum, the relational capabilities amongst firms in the LSC service archetype are not maturely developed, but are conducted on a satisfactory level. Because LSC firms have no direct impact on overall and wider supply chain operations, trustworthy and long-term *collaborative* relationships are possible and more likely to occur. Thus, these collaborations primarily rely on relational arrangements, rather than contractual ones.

Organisational Capabilities for LSC Service Provision

Within the archetype of LSC service provision, firms have poor organisational structures and undefined separation of responsibilities. Case firms 3, 10 and 11 in this sample operate separate functional departments, which focus on basic operational processes, such

as transportation management, warehousing operations, financing or accounting. Staff from other operational functions commonly handles additional responsibilities, such as customer service queries. However, the existence of separated functional areas allows LSC firms to take advantage of economies of scale.

We collaborate between our business units to a certain extent. For example, if there is a project where we need transportation and organisation of heavy cargo [...] we transfer the operations within our offices [and business units] (LSC Interviewee 11).

Even though this arrangement represents initial separation of different functions within a firm, case firm 10, for instance, places much emphasis on customer acquisition and network development across functions.

Our sales department is very innovative in terms of consolidating shipments from different customers. For example, we transport steel components on top of flowers. [...] that is also how our customer base has developed over years, in line with our organisational structure. [...] And we developed fixed deliveries over night between certain destinations (LSC Interviewee 10).

LSC firms are limited to the extent they can exploit and advance their organisational capabilities, thus they mainly focus on the operational functions that are less concerned with customer interactions; case firm 10, however, is an exception.

Knowledge and Training for LSC Service Provision

Industry know-how and knowledge about the market is considered less valuable for LSC firms. While the low entry-barriers and the highly competitive market results in a broad level of experience amongst LSC firms, training and education of staff is minimum at best and often does not adhere to standardised regulations or certifications.

We train our drivers on a regular basis, but [...] in my opinion, this is not necessary, because [qualification] is similar to any other profession. You realise very quickly, who is feasible and who is not. Some people are just born for the profession [...] that is similar to being an artist who draws a painting, they can just do it. That is why there are employees who just can handle the technical equipment and have a certain knack for the job (LSC Interviewee 11).

As highlighted by case firms 3, 10 and 11, staff is primarily trained to use specific equipment, depending on the products and customers to whom they offer their services. This might include security training and instructions for loading and unloading

operations, which can then, in turn, lead to a certain level of specialisation. In some cases, such as the case with firm 10, LSCs do develop specific industry know-how, which goes beyond the conventional and standardised service operations.

Every customer has different requirements [...] and especially where these requirements are more complex, we need a certain level of know-how. And we established this knowledge over several years. (LSC Interviewee 10)

In sum, LSC firms do not take full advantage of improving their industry knowledge or know-how towards improving their systems integration capabilities or gaining competitive advantage. LSC firm 10, however, is an exception.

4.1.2 Governance Mechanisms for LSC Service Provision

Within the archetype of LSC service provision, uncertainty and frequency are the primary drivers, from the providers' perspective, for establishing an outsourcing governance structure. Asset specificity is assumed very low, as the major service offerings are limited to transportation and warehousing. Even in cases where LSC firms might specialise in certain niche markets, they still operate on a rather basic level (i.e. executing less integrated supply chain services). Monitoring and switching costs are low, since the specification of transactions is low, hence there is little financial and relational risk associated with the governance of these arm's-length or pure market dyadic relationships. Even though LSC firms act more opportunistically in comparison to other service providers, customers are less concerned about governance risks because of the relative ease of monitoring and negotiating with the providers, both *ex-ante* and *ex-post*. Consequently, the assessment of transaction and governance costs for the archetype of LSC service provision has been deemed relatively low, as is supported by the following items of uncertainty, transaction asset specificity, monitoring costs and small numbers bargaining.

Uncertainty and Frequency of Transactions for LSC Service Provision

All LSC firms operate in a dyadic buyer-supplier relationship, where logistics activities and services are recurring on a regular and predictable basis.

The proportion of recurring services is increasing. At the moment we have certain deliveries that are similar every day [...] mainly related to customer deliveries (LSC Interviewee 10).

However, the LSC firms are unable to fully utilise their capabilities in these dyadic relationships that involve only one or a few dedicated customers. Thus, in order to maintain economies of scale and to utilise their capacities to the full extent, LSC firms tend to offer transportation and/or warehousing services to additional random customers on the spot market (i.e. to compensate fluctuation in demand).

We have a few main customers [...] otherwise, we cannot fully utilise [our capacities] because variation in demand is too high. Of course, we have other clients to help us compensate for these fluctuations. However, it is difficult to acquire new customers. [...] We seek to fill gaps in our warehouse with short-term arrangements [...], which is a challenge that we are facing every year. (LSC Interviewee 3)

This allows LSC firms to compensate for fluctuations in demand and address the problem of underutilisation (of assets). Such opportunism amongst LSC firms is common, as their primary aim is to fully utilise their capacity. Hence, they are not dependent on a single customer's orders.

We increase it [vehicle utilisation] by getting LTL or FTL shipments from our [extensive pool of] customers (LSC Interviewee 10).

This demonstrates the highly uncertain market environment LSC firms operate in. LSC firms 11, 16 and 3, for example, experience highly seasonal demand changes over the year. LSC Interviewee 11 states that "small projects that involve up to 20 vehicles per day occur randomly [and] on very short notice".

Transaction Asset Specificity for LSC Service Provision

The majority of LSC service provision is highly standardised and involves little asset specification. This favours the LSC firms' opportunistic behaviour as they can offer their services to any available customer and therefore reduce their dependency.

It doesn't matter where my vehicles are, I can always utilise my assets or resources because there are always shipments from A to B. And my assets and the equipment I can exploit, is universal. I can do whatever I want with it because all goods are standardised (LSC Interviewee 3).

However, some LSC firms, such as firm 11 and 16, access and exploit external customised equipment in order to increase their capacity and establish closer relationships with customers. Certain customers require more specialised handling and transportation assets that are typically not part of the LSC firms' core capabilities.

For some customers or projects, we [transport] certain components, such as archers and steel components that we cannot handle with our own technical equipment, due to its weight, length, or complexity. [...] we know two or three specialised partners that have the appropriate equipment (LSC Interviewee 11).

This phenomenon is contradictory to the assumption that LSC firms behave opportunistically. Grounded in TCE, opportunistic behaviour is likely to occur when firms are not willing to share information and therefore only operate in their own best interest. However, as the above excerpt by LSC firm 11 shows, they are willing to bear financial risk in cases where external acquisition of specialised equipment is required.

Monitoring and Negotiation Costs for LSC Service Provision

LSC firms typically employ an outcome-based payment scheme, which facilitates a relatively simple way of measuring service outcomes. The standardised nature of services reduces monitoring and controlling costs (*ex-post*) for the customers and ultimately forces LSC firms to provide evidence of their conducted operations.

[For long-term projects] we get paid according to the output. For example, we get paid separately for the pick-up from our customer and the transportation to our warehouse. Then, we invoice storage on a monthly basis. [...] Afterwards, we undertake the line haul transportation to the port and the actual shipping per sea freight. Payments are then made in a sequential order (LSC Interviewee 11).

Hence, there are no unforeseen or extraordinary costs associated with monitoring the LSC firms' performance for the focal buyer firm. Consequently, from a customer's perspective, there is no need to exert extra effort in supplementary monitoring or controlling for performance.

We are evaluated based on basic performance indicators, such as delivery ratios, percentage of damaged goods, keeping delivery dates and others (LSC Interviewee 10).

LSC firms 3 and 11 confirm that they do not have to meet certain performance criteria that are linked to sophisticated measurement instruments, but still have to satisfy the customers' general service quality requirements and specifications.

That is what we experience, once we were asked to provide a service two, three or four times, [the performance] must not have been bad the last times. But we cannot, or it is difficult to measure this level of [customer] satisfaction (LSC Interviewee 11).

In addition, LSC Interviewee 10, for example, refers to the process of monitoring performance via customer satisfaction as a “rather subjective evaluation”. Such low monitoring costs also indicate low switching costs within this archetype of service provision. Hence, the findings suggest that LSC firms operate in an extremely competitive environment insofar as switching providers seems to be common practice.

Small Numbers Bargaining and Switching Costs for LSC Service Provision

LSC firms consider economies of scale a critical factor required to maintain a competitive advantage in the marketplace. All of the investigated firms in this sample of the LSC archetype offer warehousing activities alongside transportation services.

We offer a combination between warehousing and transportation. [...] If they use our warehouses then it is easier for them to say [...] ‘why don’t you also conduct the transportation’. Therefore, we can coordinate loading and unloading times internally. That means that they do not have to pay or care about any holding times, compared to using an external carrier. [...] Warehousing and transportation is very closely linked (LSC Interviewee 11).

The bargaining power of LSC firms, however, is generally limited; this is particularly evidenced by LSC firms 3, 10 and 16, who demonstrate the little leverage they have with regard to determining and establishing long-term relationships that would ensure a price guarantee for at least one year. Hence, due to the competitive nature of the industry, buyers benefit from low prices and the general market is rather cost-sensitive.

4.1.3 Outsourcing Arrangements for LSC Service Provision

A collaborative relationship between LSC firms and their customers is very loosely based on achieving common goals and therefore, is dependent on the providers’ willingness to share information. Since LSC firms conduct rather supporting activities and play a minor role in the focal firm’s supply chain overall, their level of involvement in designing outsourcing arrangements is minimal. Referring to the dyadic outsourcing arrangement, LSC firms focus solely on achieving cost-efficient operations. Customers, in a similar vein, rely only on the providers’ standardised service offerings, which do not affect the overall performance of the supply chain. However, LSC firms are willing to adjust their operations to meet their customers’ requirements and aim to make their operations as transparent as possible. Nevertheless, little emphasis is placed on integrating LSC services within the broader supply chain. Thus, an overview of LSC firms’ outsourcing

arrangements demonstrates that the impact of the agency problem (i.e. the appropriate contractual/relational arrangements for different levels of information asymmetry) is very low, as is further supported by the following items.

Goal Incongruences for LSC Service Provision

Amongst all investigated LSC firms in this sample, there is no evidence that customers are particularly keen to align their goals with the carriers' capabilities. Quite the contrary, LSC firms are asked, and basically forced, to align their goals with the customers' requirements. LSC firm 11, for instance, states that "it is our responsibility as a medium-sized firm to satisfy the customers' demands whenever possible. No one in our firm will ever respond to the customers that we will not do it". This one-sided readiness to integrate and adjust operational and strategic goals might even result in diminished S performance.

[The manufacturers] damage their own logistics structure by spreading the transportation and delivery services across multiple carriers. And they do not follow the same goals. The supply chain, from the raw material to the finished goods to the local stores is disrupted by several firms, which leads to many [performance] losses (LSC Interviewee 3).

The misalignment of goals was relatively common amongst the investigated firms and results in very low perceptions of firms operating within the LSC archetype. Hence, unless collaborative arrangement with LSC firms includes properly aligned goals, the likelihood of integrating these providers into the customers' wider supply chain operations is kept to a minimum.

Information Asymmetry for LSC Service Provision

Considering the issue of goal incongruences and taking into account the LSC firms' opportunistic behaviour, the investigated firms demonstrated their willingness to provide as much information as possible to their customers by "introducing tracking and tracing systems [...] in order to determine [the customers'] requirements, or what they need in the future" (LSC Interviewee 11). However, the shippers (i.e. customers) usually show very little interest in communicating their needs and requirements with their carriers, as was discussed above. LSC Interviewee 3 stresses this issue of unilateral communication by stating that "there is none or only little exchange of information between partners [...], which is a big problem". Different perceptions and inclinations to share information consequently lead to difficulties in matching supply with demand.

The main reason for supply disruptions is a lack of communication and interaction between individual parties. And the customer is in a position, where he [*sic*] [is] forced to share as little information as possible because he [*sic*] wants to avoid opportunistic behaviour [of provider firms] (LSC Interviewee 3).

Increasingly common is the use of online platforms and sophisticated internal IT software to share data and information.

[The customers] transfer data via an online platform and we just get the order, [...] which is synchronised to our IT system. [...] That is also how [our customers] monitor shipments (LSC Interviewee 10).

The level of information asymmetry, however, is still very one sided and primarily benefits the customers as they dictate what information is shared and how it is shared. The customers are also the driving force inasmuch as they provide the majority of the IT infrastructure in terms of investments/efforts made to increase supply chain visibility.

Moral Hazard and Adverse Selection for LSC Service Provision

Firms that operate within the archetype of LSC service provision depend on, to a certain extent, exploiting their relational capabilities; they typically address this by establishing non-contractual and relational collaborations. These relationships, although they are built on trust, are straightforward and are structured around a given level of standardisation. Therefore, customers know exactly what services LSC firms provide.

The customers do not have any concerns, because they know, everything is taken care of. They know that we work well together with their service department, because they have known us for years (LSC Interviewee 11).

Risks that are associated with moral hazard and adverse selection, such as high monitoring and switching costs, are low for both providers and buyers of LSC services. All six LSC firms in the investigated sample evidence that customers know about their (the providers') capabilities and skills but they also know that they can switch providers easily. Hence, the providers' perspective on moral hazard and adverse selection is two-fold. On the one hand, providers behave opportunistically in order to fully utilising their capacities. On the other hand, LSC firms tend to not share information and are not willing to bear financial risks. LSC firms 10 and 11, for example, keep as much information about country specific regulations, such as required vehicle certifications or licenses, to themselves in order to maintain an information advantage over their customers. LSC firm 3 also states that their customers are not entirely aware of all the logistics processes.

Hence, even though these transactions are highly standardised, the LSC firms increase their bargaining power and claim to offer “dedicated logistics services [...] that no other firm can provide” (LSC Interviewee 3).

4.1.4 Systems Integration Capabilities of LSC Service Provision

As was previously evidenced, integration capabilities of any kind are very limited amongst firms within the archetype of LSC service provision. Nonetheless, the investigated case firms do offer some additional value-adding services, such as packaging and labelling of products.

For certain customers we only provide the pure transportation services [...] for others we also conduct warehousing and the final distribution within Germany (LSC Interviewee 10).

However, the scope of integration is limited due to the lack of necessary capabilities that are related to the aforementioned issues of developing strategically important and highly specific service offerings. Generally, the LSC firms’ basic resources and assets do not allow for participation in broader supply chain operations, which explains why they tend to focus on “conventional business units [where they] offer transportation from A to B” (LSC Interviewee 11). Consequently, the systems integration capabilities for the archetype of LSC service provision are very low if they are present at all, as is evidenced by the items of customer adaptation, development of PSS and adaptation to market changes, as further discussed below.

Customer and Consumer Interaction for LSC Service Provision

Communication and interaction with customers primarily remains with the buyers of (the providers’) services, i.e. the customers. Amongst the investigated LSC firms, such an understanding is widely acknowledged.

[Our] operations are only a small part within the bigger picture [...] and [the customer] has its own supply chain planning department that coordinates individual deliveries according to a [end consumer’s] time schedule (LSC Interviewee 11).

Due to their rather supportive role and given their position at the upstream end of the supply chain, LSC firms have few opportunities, and thus no motive to interact with end-consumers directly. Also, as it emerged from the observations and interviews and LSC firms lack of such end-consumer interaction, there is a danger of losing that close link

with their direct buyers (i.e. customers). LSC Interviewee 3, for instance, states that “we used to handle one hundred per cent of our customer’s shipment volume [and] today we face the situation where our customers rethink the operations internally and therefore [...] multiple carriers deliver their [inbound] shipments”.

Adaptation to Market Changes for LSC Service Provision

Given the low level of supply chain and customer integration, LSC firms were expected to demonstrate limited flexibility and capabilities that would allow them to adapt to market changes. This assumption was made based on their cost-focused operations, where the LSC firms’ primary aim is to fully utilise their transportation and warehousing capacities, leaving little room for innovation and uniqueness. However, LSC firms 11, 16, 20 and 21 evidence rather high flexibility in terms of adapting to changing customer orders.

We are very flexible, because we have three spare vehicles in our region. And because we have our own vehicle fleet, we can re-arrange deliveries quite easily (LSC Interviewee 11).

Products, Service and Systems for LSC Service Provision

Amongst the case firms within the archetype of LSC service provision, service offerings are limited to basic and standardised transportation and warehousing activities. Even though some firms, such as case firm 11, claim that their “core competence [involves] offering an all-in-one service”, there is no evidence, amongst the investigated firms, to suggest that service offerings go beyond a combination of these rather basic products. Thus, based on the empirical data, there is no indication of innovation nor continuous improvement processes with regard to LSC service provision. In particular, case firms 3, 10, 20 and 21 see their limited organisational and financial capabilities as the main barriers hindering their ability to provide integrated end-to-end supply chain services. LSC firms, therefore, remain competitive, but only amongst the basic types of service provision, focusing on the efficient and cost-effective delivery of standardised products.

4.2 Outsourcing Logistics Service Providers

Following the outsourcing boom in the 1980s and 1990s, large-scale providers for hire, - or what are also known as third-party logistics (3PL) providers – began to appear. Logistics service providers that represent LSP (out) service provision, that is a pure

outsourcing relationship, are an amalgam of firms **1, 6, 7, 12, 18, 22, 23** and **25**. LSP (out) firms primarily serve retailers and manufactures in the consumer and industrial goods industries. Their logistics processes are characterised by higher transaction specificity, such as more complex distribution networks, integrated warehousing activities and enhanced communication technologies. It is generally assumed that this archetype of service provision takes on a mediating role between suppliers, producers or original equipment manufacturers (OEM). Table 4.3 summarises the characteristics of the allocated case firms to the archetype of LSP (out) service provision.

Firm No.	LSP (out) Service Provision Characteristics	Fixed Assets / Revenue in EUR p.a.
<i>1</i>	Transportation and storage of components and small supplies, such as automotive accessories and bicycle parts. Customer base consists of OEM firms in the automobile industry.	Does not own transportation capacities; one local warehouse. Annual Revenue 8.2 m
<i>6</i>	General cargo and perishable goods, FTL and mostly LTL shipments, consolidated transportation services include pick up, transshipment and delivery. Customer base in FMCG industry, mainly retailer and wholesaler.	Few owned trucks; >10,000 transportation units; >10,000 employees; >400 global offices. Annual Revenue 4.4 bn.
<i>7</i>	CEP services; global distribution network includes pick-up, delivery and handling of small shipments. Customers in the B2B as well as in the B2C market; focus on small and urgent deliveries.	100 privately owned vehicles; 15 national offices; five European offices. Annual Revenue 140.0 mn.
<i>12</i>	Standardised transportation service and European distribution network; general cargo transportation FTL and LTL. Customer base include all industries, focusing on fashion retail and electronics.	45 collaborative firms; multiple national offices; one central and two regional distribution centres. Annual Revenue N/A.
<i>18</i>	General cargo, focusing on road, railway and airfreight transportation, FTL shipments across Europe. Customer base consists of B2B industrial producers and retailers.	Five national warehouses; four airport offices; >500 employees. Annual Revenue 15.0 mn.
<i>22</i>	European railway services; general and bulk FTL cargo. Customer base in agricultural, automotive, coal mining, wood and paper, building and chemical industries.	European-wide railway units; >20,000 trains per year. Annual Revenue 220.0 mn.
<i>23</i>	FTL and LTL shipments on a national distribution network; active subcontracting to carriers. Customer base in furniture industry.	Does not own transportation capacities; two national warehousing facilities. Annual Revenue 12.6 m
<i>25</i>	Transportation of general FTL and LTL shipments; temperature controlled food cargo; reverse logistics; freight planning. Customer base in all industries, mainly retailers in the FMCG and automotive industry.	1,800 own vehicles; 195 domestic facilities; > 12,000 domestic employees. Annual Revenue 3.6 bn.

Table 4.3: Case Firms' Characteristics for LSP (out) Service Provision

These eight investigated firms all possess similar characteristics in terms of their physical assets, customer base, relational governance and level of interaction with customers and end-consumers. Also, these firms all developed rather organically over an extended period of time.

[W]e started with a vehicle fleet of two or three cars, and today we have our own fleet of almost 100 vehicles [...], including normal transporters and 7 ½ ton trucks [...], 7 ½ ton trucks with hangers [...], but [we] also conduct conventional car deliveries, such as packages (LSP (out) Interviewee 7).

The following Figure 4.2 summarises each case firms assessed characteristics within the archetype of LSP (out) service provision.

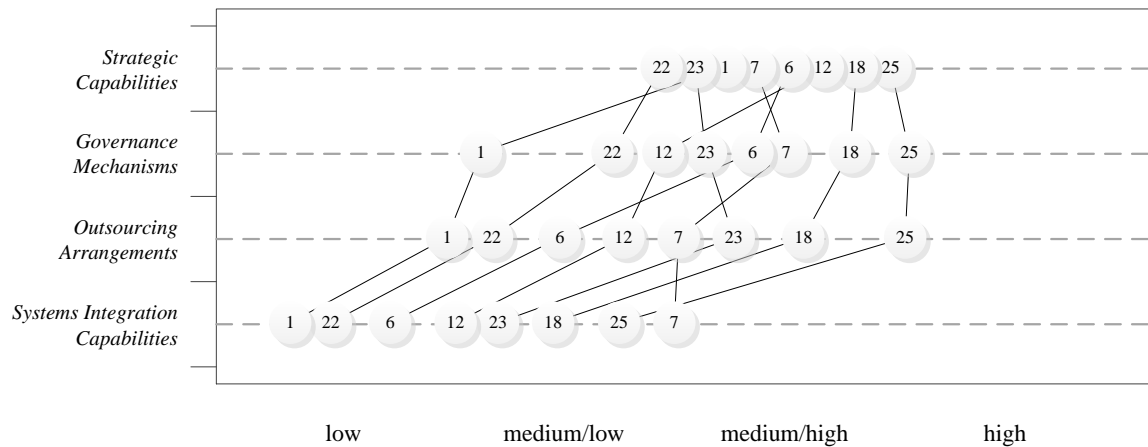


Figure 4.2: Empirical Evaluation of LSP (out) Service Provision

The following subsections present the case study findings via the analysis of the interviews that represent the archetype of LSP (out) service provision. Furthermore, Figure 4.2 summarises each of these empirically evaluated constructs as they pertain to the archetype of LSP (out) service provision.

4.2.1 Strategic Capabilities for LSP (out) Service Provision

The main items contributing to the constructs of strategic capabilities for service provision within the archetype of LSP (out) firms are physical assets, relational governance, contractual length, organisational structure, industry knowledge, industry experience, trust and training. The case firms emphasise their physical assets and relational capabilities, which operate as their primary source of competitive advantage. In this way, LSP (out) firms move towards providing more specialised services within niche markets by exploiting their relational capabilities. However, they also realise the simplicity involved in switching partners and serve a wide range of customers in different industries. Such behaviour implies a high level of relational capabilities and very high organisational and intangible capabilities. Consequently, LSPs (out) firms have established rather advanced strategic capabilities, as is supported by the following items

of physical assets, relational capabilities, organisational capabilities and know-how, which are discussed below.

Physical Assets for LSP (out) Service Provision

The exploitation of tangible resources, in the form of physical assets, is the most essential strategic capability amongst LSP (out) firms. In particular, LSP firm 12 states that “we have access to a multiplicity of our own facilities and branches” (LSP Interviewee 12). The single most distinguishing factor amongst LSP (out) firms is that they can either own the assets themselves or access them through external partner firms. Both equally contribute to the enhancement of their tangible strategic capabilities. Case firms 6 and 12, for instance, are partners within a larger consortium of various logistics firms that share their assets and resources unrestrictedly with each other.

[Our firm] has access to ... well, there are different models. We either use our partner's own vehicle fleet or we expand through additional subcontractors. Some partners exclusively use subcontractors. That means they do not have a single vehicle. [...] In addition, [our firm] possess a pool of trailers, consisting of several thousand swap trailers which are used to deliver cargo within Germany every day (LSP (out) Interviewee 12).

Such collaborative relationships represent a very high degree of asset exploitation abilities, suggesting a strong competitive advantage, in terms of Barney's (1991) VRIO framework. However, these assets are neither scarce nor difficult to imitate, which in turn implies that while a competitive advantage can be achieved, it may not be necessarily sustainable. The fact that assets can be distributed and utilised in a broader scope of operations might not increase the competitiveness of owning these types of assets, but it does imply ease of access, which could increase the likelihood of better accessing and exploiting them.

We exploit our contractors' capabilities and assets, such as vehicles and trailers, especially for the regional deliveries to the final customers (LSP (out) Interviewee 6).

All of the investigated firms, within this archetype, aim to exploit their physical assets and resources (through owning or sharing) to the extent of which they can, at the very least, establish a general distribution network or transportation structure across a certain geographic area.

Abroad, we have five locations within Europe, which are structured in a similar way to the offices in Germany (LSP (out) Interviewee 7).

LSP (out) firms also exploit operational equipment, such as vehicles and warehouses from sub-tier carriers.

We mainly have own facilities within Europe. However, in other countries, such as Scandinavia and to a certain extent in Eastern Europe, we work closely with our partners [and] sometimes our subcontractors only provide one part of a vehicle [...] and we provide the appropriate trailer (LSP (out) Interviewee 6).

Relational capabilities for LSP (out) Service Provision

LSP (out) firms generally distinguish between short-term and long-term collaborations with their primary customers, which in turn impacts the degree of integration across the supply chain. In line with exploiting (i.e. through sharing) physical assets amongst each other, LSP (out) firms, in this sample, seek long-term relationships, preferably on a contractual basis, as is evidenced by case firms 6 and 23, for example.

We make sure that we collaborate and convince the biggest, second biggest or third biggest partner in each country to [build] a long-term collaboration (LSP (out) Interviewee 6).

The nature of long-term collaborations, however, is more of a relational rather than a contractual basis. LSP (out) firms are substitutable and due to the highly competitive environment amongst service providers in general. Thus, they depend on cultivating their collaborative relationships, albeit non-contractual relationships.

In various international countries, such as South America or China and also in Eastern Europe, especially in Russia, we collaborate with selected partners over many years (LSP (out) Interviewee 23).

Furthermore, LSP (out) Interviewee 6 states that “all our partners see the collaboration as a long-term investment into the future development”. Hence, many operations are conducted without a contract, as is typical of arm’s-length relationships. LSP (out) Interviewee 23 also confirms this trend, suggesting that “for the sole transportation services, most of the relationships are [conducted] on a daily basis”.

In sum, relational capabilities are perceived to be very important, even though the possibilities for switching partners are quite high (for the customer). Furthermore,

exploiting collaborative assets and resources in a collaborative manner amongst provider firms proves to be a distinguishing factor for LSP (out) service provision.

[Collaboration] is highly valued and we [the provider firms] meet and see each other on a regular basis [...]. And the partners are obligated to actively volunteer. We measure the time they engage [with other partners]. There are certain scales of how many hours a CEO or an owner of a firm [engages] per year or per month (LSP (out) Interviewee 12).

Therefore, relational factors are evaluated as important and depend on the mutual understanding and collaboration amongst provider firms. Such relational factors, however, must be strengthened by implementing fixed contractual terms.

Organisational Capabilities for LSP (out) Service Provision

All investigated LSP (out) firms developed their network and organisational capabilities organically, over a period of time. It is common practice, amongst these firms, to coordinate a sophisticated and established supply network that consists of transportation links, warehouse facilities, as well as pick-up and delivery points.

Of course, we have a hub and spoke network. [...] We have one central hub [central DC] and two regional hubs [regional DCs]. We also chose a very central location in Germany, as have others. [However,] some providers do not have a central hub; [firm A] and [firm B] deliver through collaborative partners without a hub. [Firm C], on the other hand, has one [hub]. But we have two regional hubs in addition (LSP (out) Interviewee 12).

Hence, there are different ways of how to structure and exploit relational capabilities (through collaboration). Organisations differ by using their own capabilities and expand on those using sub-tier structures, as is illustrated by LSP (out) firm 7.

We coordinate the deliveries within our own [transportation network]. That means our branches do not compete against each other. We do not want a network that consists of sub sub-tier suppliers [...] and the subcontractors are not allowed to use any other or additional third party (LSP (out) Interviewee 7).

In addition, all investigated LSP (out) firms confirm that they offer several services to their customers, within and across industries, such as “different transportation and delivery services considering various lead times, from which the customers can choose” (LSP (out) Interviewee 6), in order to increase their competitiveness. However, this is only possible if the organisational culture and structure allow operations to occur across

a wide and broad scope and scale. Problematically, services offered across different business functions or units are often poorly connected and linked to each other.

The global structure developed within the last 15 years [...] through specialising in industries other than just cheese trading, such as industrial goods. [Hence], we developed three business units focusing on 'European Logistics', 'Food Logistics', and 'Sea and Airfreight', which are partially connected (LSP (out) Interviewee 6).

Four of the investigated LSP (out) firms transfer their organisational attributes, such as culture, corporate design and hierarchical structure, to their partners or sub-their contractors. "[Our subcontractors] collaborate on a long-term basis, and they adopt our corporate design" (LSP (out) Interviewee 6). This alignment of corporate structures and organisational culture also increases the presence and reputation of the firms' brand. LSP (out) Interviewee 12, for example, states that within the organisation and amongst all subcontractors "when you enter the office, all loading and unloading equipment, posters, brochures [...] [corporate] notebooks, pens, everything is standardised".

Knowledge and Training for LSP (out) Service Provision

The nature of the industry in terms of its competitive environment is similar to that of the LSC archetype, characterised by low entry barriers. The entry requirements do not call for sophisticated training and/or knowledge about the industry, insofar as the offered services and resources can be accessed easily and at a relatively low cost. However, all LSP (out) firms in this sample invest heavily in peripheral information technology as well as the training and education of their staff. LSP (out) Interviewee 7 states that "we can do a lot [with our IT system], which we develop continuously. Even I [the interviewee] might need training if I used it on a daily basis [because] there are constant alterations that take place". LSP (out) firms make sure that commercial and industrial employees are trained equally in order to ensure the level of knowledge is maintained. Consequently, the LSP (out) case firms can specialise their operations and target niche markets more specifically.

We strongly specialised on the automotive industry, and focus in time-critical transport services. [...] We continuously developed our knowledge, and finally focused on a niche market of time-critical deliveries, CEP services and also regular long-haul transportation (LSP (out) Interviewee 7).

Such specific targeting of niche markets is also distinctive of the archetype for LSC service provision, since "our (LSP (out) firms) structure differs from those of standardised

and classical transport carriers” (LSP (out) Interviewee 7). Their ability to specialise and develop specific knowledge increases these case firms’ attractiveness for customers in various other industries. LSP (out) firm 6, for instance, demonstrates this phenomenon of superior knowledge inasmuch as “we can use our expertise and knowledge in logistics processes, because the customer knows sales, they [the customers] know production processes and so on, that is their area of specialisation”.

4.2.2 Governance Mechanisms for LSP (out) service provision

The main items that contribute to the governance of LSP (out) service provision are asset specificity, frequency/uncertainty of transactions, monitoring and negotiation costs, as well as small numbers bargaining. The sample case firms stressed uncertainty and frequency of transactions as the primary factor impacting governance, but *ex-post* contracting costs associated with monitoring and switching partners and customers were highly acknowledged as well. LSP (out) firms are aware of the risks associated with outsourcing and thus tend to avoid opportunism. Hence, they aim to reduce these transaction-related costs and are willing to bear more risk in accommodating customers and establishing long-term relationships. Negotiation and contracting costs (*ex-ante*) were not mentioned specifically, likely a result of the clearly stated and commonly known service offerings, as is especially the cases in arm’s-length relationships. Consequently, both governance mechanisms and transaction costs for LSPs (out) service provision are high, and is supported by the items of uncertainty/frequency, asset specificity, monitoring/negotiating costs and small numbers bargaining, is given as high, as further discussed below.

Uncertainty and Frequency of Transactions

LSP (out) firms have developed capabilities in order to adapt to demand fluctuations and the uncertainty associated with customer orders. Due to their large-scale provision of operations, as well as their established distribution networks, LSP (out) firms are able to easily increase the utilisation of their assets. In addition, they maintain a certain level of utilisation in order to smoothen uncertain demand. Particularly, in both the consumer goods (e.g. food retailing) and the industrial goods industry (e.g. automotive suppliers), demand is highly dependent on consumer behaviour and seasonal fluctuations.

We have massive seasonal fluctuations. Now it is rather busy. In July or August, at the latest, it gets much quieter (LSP (out) Interviewee 12).

While, recurring transactions within this archetype are very predictable (e.g. basic deliveries from and to retail stores), they are also, at times, highly irregular in terms of their occurrence (e.g. emergency deliveries that mostly occur for spare parts for automotive OEMs).

The [transportation] process itself is very predictable; however, the time it is demanded is not always predictable. Certain customers, for example, rely on weather or seasonal conditions. [...] We do not know in advance how much [we have to transport] or when and to what extent (LSP (out) Interviewee 23).

LSP (out) firm 7, for instance, states that “we do not know today, what we are delivering tomorrow. We do not have fixed routes. But we have dedicated destinations [for when] we use specific carriers”. Such dedicated destinations demonstrate how even when uncertainty is fairly high, LSP (out) firms have ways of coping with these types of unpredictable transactions. Additionally, such methods have proved valuable for the development of provider firms’ relational capabilities, as well as their capabilities with regard to gaining easy access and subsequently exploiting external resources and assets.

We react [to fluctuations] by chartering subcontractors on the market. Or we prepare for certain time periods, such as Easter, by looking into historic capacity and demand requirements [...] and we evaluate this information in order to predict what we need (LSP (out) Interviewee 6).

In addition, LSP (out) firms 18 and 23 evidence that not only are transactions influenced by seasonality and demand fluctuations, the ratio of return deliveries also plays a crucial role in maintaining a high utilisation level.

Transaction Asset Specificity for LSP (out) Service Provision

Due to standardised network capabilities and given a wide customer base, specificity of assets for service transactions is rather low. LSP (out) firms achieve economies of scale and use their assets to serve different industries. LSP (out) firm 7, for example, exploits transportation capabilities to primarily serve the general pharmaceutical industry in Germany, but also services other industries, as is demonstrated by the excerpt below.

We transport chilled products within a specific temperature range [...] and offer our services to the pharmaceutical industry. [...] This is a separate business function, that we offer [to other customers] at a more costly rate because this is a sort of niche market (LSP (out) interviewee 7).

Case firms 12, 18 and 22 also confirmed such behaviour and consequently, it can be deduced, that LSP (out) firms primarily use their relational and organisational capabilities in order to increase and particularly maintain their competitiveness. Even though some transactions require more specific equipment, such as specialised warehousing facilities and vehicle capacities (e.g. for long and/or overweight cargo), LSP (out) firms are not limited to a specific industry and are able to cope with these types of transactions. Surprisingly, even those LSP (out) firms that explicitly focus on niche markets, such as case firms 22 and 26, operate within a very competitive environment. Hence, asset specificity for transactions has a relatively small impact on the firms' service provision.

Monitoring and Negotiating Costs for LSP (out) Service Provision

Amongst all LSP (out) firms, negotiation costs (*ex-ante*) did not play a major role in developing outsourcing relationships. The case firms utilise their relational capabilities in order to establish contractual arrangements, which are typically pre-defined and shared amongst partners and providers. The analysis revealed that there is a trend towards the monitoring and follow-up (*ex-post*) of both upstream and downstream service quality.

[The customer] can trace the pick-up; they know exactly when the goods are on the vehicle. And he [*sic*] knows exactly when the goods are picked up and [when they] are delivered (LSP (out) Interviewee 7).

However, these measures are rather basic considering complexity, confirming the low transaction specification, as it was previously mentioned. LSP (out) firms 6 and 12 also rely on basic ratios, (e.g. on-time delivery and order accuracy), in order to assess quality.

We provide quality measurement that represents a clear evaluation of our provided services. Consequently, this measures our quality. Our processes are monitored on a daily basis, so we have some security and can guarantee that the quality is high within the entire network every day (LSP (out) Interviewee 6).

These quality measurement indicators only require basic data and widely available information, which are also the basis for billing, invoicing and payment of services.

We provide all relevant information, such as scans and order data, electronically. We are totally transparent in this area, from the processes to the final vehicle [we use]. [Delivery rates] are fundamental performance indicators, which we measure precisely. So we can project our accuracy for deliveries to the final customers (LSP (out) Interviewee 12).

Furthermore, LSP (out) firm 23 stresses the large amount of individual transactions and operations they conduct per day, which are billed solely based on the available information regarding the delivered units.

There are certain performance measurement indicators that serve as the basis for billing [...] including shipment receipts per pallet, or per picks and so on. [...] We use these basic indicators for our billing (LSP (out) Interviewee 23).

The only indicators that need to be addressed in more detail (i.e. in the pre-contractual negotiation phase) are customer claims and quality errors, such as missed deliveries (i.e. time window constraints) or the handling of damaged goods. These measurement indicators, however, also the most basic and traditional ratios, which also favour the bargaining power of LSP (out) firms.

Small Numbers Bargaining and Switching Costs for LSP (out) Service Provision

Small numbers bargaining plays a controversial role amongst the investigated LSP (out) firms. On the one hand, providers can choose from a large number of sub-tier suppliers and therefore exploit their buying power. On the other hand, the number of potential customers is fairly high, leading LSP (out) firms to target specific industries and niche markets. LSP (out) Interviewee 6, for example, states that “in most countries there are not many big players in the market, and it is a rather misleading estimation [...]. And the market becomes more and more concentrated”.

Reducing the number of competitors and targeting a smaller number of customers, increases the providers' bargaining power (i.e. supplying power) and, in turn, increases the switching costs for the buyers of such services.

In five to ten years, the market will be adjusted to an extent, where [there will] not [be] much choice for potential providers anymore (LSP (out) Interviewee 6).

4.2.3 Outsourcing Arrangements for LSP (out) Service Provision

The main items contributing to outsourcing arrangements for LSP (out) service provision are goal incongruences, information asymmetry, moral hazard and adverse selection. All LSP (out) case firms within this sample strongly relate the issues of goal incongruences and moral hazard to the customers' reluctance to share information, which consequently

leads to non-transparent operations across the supply chain. It is, however, the opportunistic behaviour of the customers that limits the providers' willingness to share information and/or bear more financial and relational risks. Thus, even though LSP (out) firms set forth to achieve common goals, they suffer from their customers' opportunism. Consequently, outsourcing arrangements remain rather unimportant inasmuch as they cannot be influenced by the providers' behaviour. The supporting items relating to the constructs of goal incongruences, information asymmetry and moral hazard/adverse selection, are further discussed below.

Goal Incongruences for LSP (out) Service Provision

LSP (out) firms evidence more of a willingness to alter their goals according to their customers' needs. Case firms 6, 7 and 23, for instance, all readily adapt their capabilities in order to meet their customers' needs, accordingly.

Our vision, first and foremost, is to always understand what the customer's problem is. Only then, will we find a way to solve it (LSP (out) Interviewee 23).

The driver for resolving goal incongruences clearly lies with the provider firms. LSP (out) Interviewee 7 highlights that "we sit and get together with them [our customers] in order to evaluate [...] what factories [i.e. production and warehouse facilities] they [our customers] have and what issues we need to solve". LSP (out) firms go far as to initiate investments in order to satisfy customers' and end-consumers' needs; needless to say, this also works to maintain the providers' competitive advantage in the marketplace.

It is our responsibility, as a service provider to accept all of our customers' requests and orders, and afterwards we look for solutions. [...] We invest and hope that we can keep their business in the future (LSP (out) Interviewee 23).

Problematically, and at the expense of the service providers, service provision is not entirely incorporated into the culture and organisational structure of focal firms' end-to-end supply chains.

[Goals should be better aligned] especially between producers [...] and retailers. Because, at the moment, both ends [of the supply chain], focus on reducing costs regarding logistics; they do not consider in-house logistics, for instance, at all (LSP (out) Interviewee 6).

Thus, as can be gleamed from the above excerpt, goal incongruences are typically at the expense of the service providers.

Information Asymmetry for LSP (out) Service Provision

In line with goal incongruences, LSP (out) firms also aim to reduce information asymmetry in order to reduce risks associated with moral hazard and adverse selection. And it is the providers, who act as the main drivers for making processes and operations as transparent as possible.

We guarantee information availability for our customers across our organisation (LSP (out) Interviewee 6).

However, the competitive environment, along with specific customer requirements, incites such behaviour of making information available. LSP (out) firm 6 emphasises the need for a continuous information flow that stretches across the entire supply chain.

I believe it is very important to know what the information flows will like in the future because I think that there are two types of flows. The physical material flow, on the one hand, and on the other hand, this information flow. And we ... we are interested in identifying where this information flow starts. Does it start with the producers or at the end of the production line? [...] It usually ends at some point when it hits the shelves of the retailers. At the moment, it [the information flow] is not continuous; it is interrupted at several points, [since] several service providers are in charge (LSP (out) Interviewee 6).

Furthermore, information asymmetry greatly impacts the condition of moral hazard and adverse selection, particularly for LSP (out) firms, as it is discussed below.

The risks of moral hazard and adverse selection, associated with opportunistic behaviour are of high importance to the LSP (out) case firms, given that the buying power of customers transfers financial and reputational risk to the providers. LSP (out) firms, therefore, try to overcome these issues by reducing the level of information asymmetry. Case firm 7, for instance, finds that their customers appreciate their involvement and efforts to make operations more transparent.

We introduce ourselves [and our services] in order to clarify what we do, how we can help [our customers], what we offer, [and] the additional services we provide, [besides] the transportation from A to B (LSP (out) Interviewee 7).

However, customers on the other hand, are not always interested in the service providers' willingness to share information.

Mostly, our customers do not even have the necessary information when they require certain transportation services because they don't believe that it is their responsibility (LSP (out) Interviewee 23).

Information and availability of data is more crucial when it comes to large-scale contract bids. On these occasions, customers will demand specific requirements *ex-post* that relate to the design and specification of the contract. Case firm 6, for example, experiences such behaviour from customers; however, they note that these pre-contractual negotiations are poorly related to future requirements, which undermines the actual benefit of data availability at an early stage.

There are different requests in global bids, [where customers ask] how and what we measure and what the impact of these measurement indicators will be. But there are no clear predictions as to what these will be in the future. However, we need to be transparent and prepare for future needs (LSP (out) Interviewee 6).

In sum, there seems to be many misalignments in (1) what the customers know, (2) what they want to know and (3) what they need to know. Referring to moral hazard and adverse selection issues this misalignment might be based on different interests and motivations of each firm.

4.2.4 Systems Integration Capabilities for LSP (out) Service Provision

The main items contributing the systems integration capabilities of the archetype for LSP (out) service provision are customer interactions and the ability to adapt to market changes. In addition, the ability to develop products, service and systems (PSS) has gradually emerged and reflects an increasing importance amongst case firms within this archetype. The empirical data demonstrates how outsourced activities and services remain on the periphery and are not fully integrated into the customers' organisational structures. Despite the fact that LSP (out) firms offer supplementary value-adding services to their products, such as customer service and after sales assistance, integration remains minimal at best, leaving limited space for the provider firms to operate within and restricting their ability to organise cross-functional transactions. Consequently, the systems integration capabilities for LSP (out) firms are rather low.

Customer and Consumer Interaction for LSP (out) Service Provision

A major distinction in supply chain integration amongst providers firms, in general, is between upstream integration focusing on suppliers and downstream integration focusing on customers and end-consumers. LSP (out) firms evidence both directions of integration. Case firms 7, 12 and 22, for instance, are very concerned with controlling as many parts of the upstream supply chain as possible.

We are in charge of [...] controlling the CEP services [...] for customers, such as [automotive OEM] and its suppliers [...], which have multiple factories in Europe (LSP (out) Interviewee 7).

Such upstream integration has been deemed vital in most services and for successful collaborative relationships. Hence, these LSP (out) firms aim to establish contractual and long-term relationships with OEMs and producers in different industries.

In the future we want to become integrated into firms and organise in-house logistics processes. We can then provide additional logistics activities starting from the production line (LSP (out) Interviewee 6).

Thus, LSP (out) firms demonstrate their inclination towards enacting an integrator role. LSP (out) Interviewee 23 stresses that “our core competence is in warehouse logistics, including the upstream activities, such as procurement from Far East or other Arabic countries [and] also collection from suppliers”. However, the barriers with regard to communicating with customers, end-consumers and the actual market demand restrict their desired level of integration. In this sense, LSP (out) firm 6, for instance, does not serve end-consumers at, but merely offers services to retailers, who act as their final customers.

Adaptation to Market Changes for LSP (out) Service Provision

The restrictions amongst LSP (out) firms that hinder end-to-end supply chain integration also impact their ability to adapt to market changes. Despite claims of being flexible, LSP (out) firms fail to interact or establish interference to the actual market demand.

We are very flexible, because we command medium sized firms, which are always more flexible. We are very close to the regional [customers] where services are required. Of course, we have access to much quicker and more agile units and can react to market changes (LSP (out) Interviewee 12).

All LSP (out) case firms in this sample cited flexibility as the primary determinant for their adaptation capabilities. However, this was not clearly evidenced, insofar as none of the interviewees were able to describe *how* their firms have adapted to the dynamic and rapidly changing market. More commonly, flexibility is guaranteed via the nature of the market and is often associated with the ease of accessing sub-tier suppliers and providers. LSP (out) Interviewee 7, for instance, is “extremely flexible in terms of changing destinations or pick-up locations, we are very quick and the customer can make changes without experiencing any additional costs”. Adaptation to changing customer demands, however, occurs on a very low level and typically only involves standard transportation services.

Products, Service and Systems for LSP (out) Service Provision

LSP (out) firms offer products that span beyond the conventional transportation services, including warehousing, in-house logistics, packing and handling, procuring and all other associated supporting activities. However, case firm 23 made a fair point, when they offer a wide range of services, but they still do not see the need for a continuous integration or adaptation with the customers or end-consumers.

There is no customer that needs everything, one day maybe. [...] We can offer all-in-one solutions, but does the customer really need that? (LSP Interviewee 23).

Thus, the development and emergence of PSS for the archetype of LSP (out) firms is not consistent and, therefore, such development was not evidenced.

4.3 Institutional Logistics Service Providers

In line with the development of the 3PL industry in Europe during the 1980s and 1990s, service firms have narrowed their capabilities and started specialising on niche markets. Such providers are basically institutionalised into a focal firm’s hierarchical structure and therefore offer individuated services to a single customer across manufacturing, production, retail and consumer goods industries. This purely hierarchical and institutional corporation is represented by an amalgam of the case firms **2, 4, 5, 8, 15, 17, 19** and **24** from this sample and comprises the archetype LSP (inst) service provision. LSP (inst) firms are not limited to offering their services to any particular industry, but focus their operations on niche markets. Generally, LSP (inst) service provision is highly integrated into the customer’s supply chain and operational processes, following a

hierarchical governance structure. Here, LSP (inst) firms are solely responsible for coordinating and managing the internal and external logistics and sourcing activities. Table 4.4 summarises the allocated LSP (inst) case firms.

Firm No.	LSP (inst) Service Provision Characteristics	Fixed Assets / Revenue in EUR p.a.
2	Distribution of organic food products and raw material. Customer base in the food industry primarily includes national retailers.	No privately owned transportation capacities; one local warehouse. Annual Revenue 146.4 mn.
4	National transportation and replenishment of gas and oil, using road and railway systems. Customer base in gas and oil industry dedicated to one client.	Three national storage facilities; ten European offices, <100 own HGVs. Annual Revenue 21.3 mn.
5	Import of electronic products; European distribution of LTL shipments and consumer goods. Main customer based in the high-tech retail industry.	One central European distribution centre; two national offices. Annual Revenue 120.5 mn.
8	National delivery of fashion products, FTL and LTL shipments, material handling and order management services for Asian-European distribution network. Customer is a global fashion retailer	Confidential (!) Annual Revenue N/A.
15	Supply chain wide solutions, including replenishment and delivery of bulk cargo in FTL shipments on a national scope. Customer is a German groceries retailer.	Two warehouse facilities; 180 employees. Annual Revenue N/A.
17	National distribution of fashion products, FTL shipments and small parcels. Customer is a global fashion retailer.	Multiple national warehousing facilities; >10,000 global stores. Annual Revenue N/A.
19	In-house transportation of pharmacies and small parcels; national distribution and delivery to end consumers within two hours. Customer based in the European pharmaceutical industry.	One central and 24 regional distribution centres; no privately owned transportation assets. Annual Revenue 268.8 mn.
24	Organising replenishment and distribution of food products within Europe; FTL and LTL shipments; cross-docking in Benelux. Customer is global food producer.	Confidential (!) Annual Revenue N/A.

Table 4.4: Case Firms' Characteristics for LSP (inst) Service Provision

All of the investigated LSP (inst) firms possess similar characteristics, especially in terms of their customer base and distribution operations, where “we supervise out customer’s operations in terms of [...] transportation planning [...] and we are completely integrated into our customer’s functional areas” (LSP (inst) Interviewee 15). Figure 4.3 summarises each case firm’s assessed characteristics within the archetype of LSP (inst) service provision.

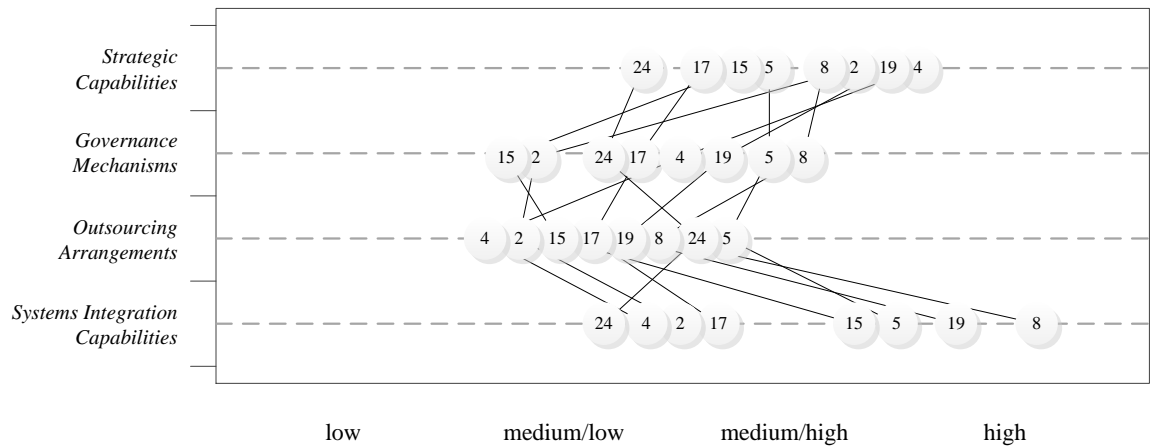


Figure 4.3: Empirical Evaluation of LSP (inst) Service Provision

The following presents the case study findings from the analysis of the interviews that represent the archetype of LSP (inst) service provision, regarding strategic capabilities, governance mechanisms, outsourcing arrangements and systems integration capabilities.

4.3.1 Strategic Capabilities for LSP (inst) Service Provision

The main items contributing to the strategic capabilities for the archetype of LSP (inst) firms are physical assets and relational capabilities. The close relationship and dedication to a single customer allows the LSP (inst) firms to fully exploit their own assets. Hierarchical structure (i.e. internal relations) with the customer are more advanced internally with the customer and external collaborative relationships are disregarded, due to the fact that LSP (inst) firms arrange and organise their services within their customer's network and organisational structure. Their focus is to provide efficient/effective logistics operations that favour the customer terms of either cost-reduction (represented amongst firms 2, 5, 15, 17 and 24) or time and availability allotments (represented amongst firms 4, 8 and 19). LSP (inst) firms develop strategic capabilities, due to their dependency on a single customer, as is described below and supported by the items of physical assets, relational and organisational capabilities, as well as knowledge and know-how.

Physical Assets for LSP (inst) Service Provision

All investigated LSP (inst) firms have access to transportation and warehousing assets or equipment that they have acquired over time, with the exception of case firms 5 and 24, which only have access to warehousing facilities. However, the ownership of physical assets is different amongst the investigated firms in this sample. Most firms (i.e. firms 2,

4, 5, 17 and 24) rely explicitly on their customer's assets, due to the high investments required to acquire specialised equipment.

The specialised containers cost about 80,000 USD. [...] As a medium-sized enterprise, we could not afford that investment [...] because we needed ten to 20 of those containers (LSP (inst) Interviewee 4).

LSP (inst) firm 4, for instance, could not afford the initial investment required, which resulted in a joint-venture with the customer and now, as the customer proclaims, "we are the exclusive service provider for that customer" and 95% of the equipment is owned by this particular customer. This strategy of sharing assets is also evidenced by LSP (inst) Interviewee 5, who "aim[s] to develop distribution networks [in all European countries] where [their customer's] stores act as dedicated depots. [...] Therefore we can guarantee same day delivery". It is widely accepted, amongst the LSP (inst) firms that physical assets contribute most to their competitive advantage.

Our most important asset is the equipment [...] because it is specific to the products. [...] We cannot use it for shipments or material [handling] of any other company (LSP (inst) Interviewee 4).

This excerpt represents the distinct focus placed on physical assets within this archetype of service provision. What distinguishes this archetype from basic LSC firms is the specificity of assets and dedicated customer relationships.

Relational Capabilities for LSP (inst) Service Provision

Relational capabilities for LSP (inst) service provision are distinct given the focus on fostering close relations with the focal firm (i.e. customer) rather than external relations with third-party suppliers. Internal relations are highly dependent on the customer's willingness to collaborate and its attitude towards sharing assets and information.

We can only guarantee same day delivery if we manage to consolidate all of his [sic] [customer's] capabilities in order to develop this huge distribution network (LSP (inst) Interviewee 5).

LSP (inst) firms 4 and 15, for instance, foster internal integration with their customers. LSP (inst) Interviewee 4 states that "we undertake the entire internal logistics operations for our customer. We are not allowed to use any subcontractors for transportation [...]. Everything must be conducted by ourselves". LSP (inst) Interviewee 15 emphasises that they are "part of [the customer's] production planning process". Hence, only if both

parties align their assets and capabilities, can mutual benefits be achieved in terms of end-consumer satisfaction, as is further highlighted by LSP (inst) firm 5.

Another benefit of [this collaborative] distribution network is that he [sic] [the end-consumers] can buy [any product] in any country and return or exchange it in any other country or store [of their choice] (LSP (inst) Interviewee 5).

Successful collaborative relationships, in this context, thus demonstrate the importance of collaboratively used assets. In the above case, that allows consumers to choose the store, where to return their products.

Organisational Capabilities for LSP (inst) Service Provision

Drawing on the close relationship with their customer, LSP (inst) firms are able to offer advanced organisational capabilities that go beyond a dyadic buyer-supplier relationship. A hierarchical governance form enables the case firms to conduct their service operations efficiently by tailoring them specifically to their customer's requirements.

We are governed as an internal logistics firm [...] that operates and handles about 80 per cent of the [customer's] total volume per year (LSP (inst) Interviewee 15).

LSP (inst) firm 5 also advocates the benefits of being incorporated into the customer's organisational structure.

Due to the frequent interaction with our customer's stores, we can predict future demand very well and therefore anticipate our [...] capacities [capabilities] in advance. [...] We then can estimate if our provider [sub-tier carrier] is capable of coping with [the customer's] requests (LSP (inst) Interviewee 5).

The high level of provider interaction and involvement with the customer's distribution and logistics network allows LSP (inst) firms to build strong competitive positions in the marketplace. As a result, they are able to develop advanced organisational and relational (internal) capabilities, contributing to their superior performances.

Knowledge and Training for LSP (inst) Service Provision

Knowledge development and industry know-how amongst the investigated LSP (inst) firms are very specific and continuously being improved, which results in a transparent information sharing processes.

We introduced a so-called knowledge database, where we store all market rates and prices [from the sub-tier carriers], and also all requests we made. [...] Therefore, our controlling department has a better understanding of how to negotiate prices in the future (LSP (inst) Interviewee 5).

Also, the high specification and handling requirements of products forces the firms to properly train their staff in order to provide high quality services.

We [...] only employ drivers that are trained specifically for the products. They know, for example, the chemical compositions and so on, and they know how to load and unload the products [...], which is representative of our quality (LSP (inst) Interviewee 4).

Hence, instructions and manuals are updated continuously and employee training is conducted frequently across all investigated LSP (inst) firms.

4.3.2 Governance Mechanisms for LSP (inst) Service Provision

Referring to transactions costs and the underlying governance structure, LSP (inst) firms 4, 15 and 19 entail a high specificity of assets due to the nature and characteristics of the focal customer's product and consumer range. All other LSP (inst) firms within this sample offer rather standardised (i.e. low specificity) of assets. However, the frequency and occurrence of logistics activities in these firms are highly predictable and appear to stabilise over time. Monitoring and switching costs are of little interest to the customers insofar as they are mostly dependent on the provider firm's services. Therefore, asset utilisation (i.e. productivity) and operations efficiency is controlled and monitored solely by the provider firm, which results in provider opportunism. The resulting high switching and negotiation costs increase the governance risk for the customer, especially when they are in an established contractual relationship (*ex-ante*). Consequently, transaction costs and governance risks for LSP (inst) service provision are high (for the customers), as they pertain of switching and/or re-negotiating activities. Generally, governance mechanisms usually follows a rather hierarchical structure, as is supported by the items of uncertainty, asset specificity, monitoring/negotiating costs and small numbers bargaining, as discussed below.

Uncertainty and Frequency of Transactions for LSP (inst) Service Provision

The frequency and predictability of logistics activities are surprisingly high amongst all LSP (inst) firms and are seemingly unaffected by seasonal demand fluctuations. Opposed

to LSP (out) firms, the case companies in this sample do not face any major issues regarding the utilisation of excess capacities and can largely avoid subcontracting their assets to multiple suppliers on the market. LSP (inst) Interviewee 5 states that any unpredictable “ad-hoc operations [or any] additional demand only accounts for five % of the total annual volume”. Case firm 15 highlights the stability of their operations throughout the year, underlining the rarity of uncertainty.

Distribution and logistics activities are the same every week [...]. In 90% of the cases, our deliveries go to the same destinations [...] and annual demand is very predictable and stable [...]. We do not have any seasonal fluctuations. [...] Overall, there might be a change of destinations that affect about five per cent of the total volume [...], which makes our logistics very easy to coordinate (LSP (inst) Interviewee 15).

However, in situations where demand is fluctuating and rather unpredictable, LSP (inst) firms have the capabilities, due to their integrated customer relationships (i.e. organisational structure), to maintain a high utilisation ratio. LSP (inst) Interviewee 4, for instance, states that “we can plan the uncertainty of emergencies [because] we are part of [their] daily business”. Hence, even during times when transactions are infrequent, demand is still manageable. Additionally, LSP (inst) Interviewee 15 states that they “subcontract to external carriers twice a week, every Wednesday and Thursday”, which also supports high degree of manageability for uncertain transactions.

Transaction Asset Specificity for LSP (inst) Service Provision

Assets are not the main factor determining specificity for LSP (inst) service provision; rather, due to the close customer relationships and large scope of operations, transactions, in the form of integrated services, become more complex and need to be addressed individually.

The transactions themselves are all very standardised and basic [...], however, it gets more complex when we use multiple transportation modes [...], and therefore the number of interactions that need to be considered increases (LSP (inst) Interviewee 4).

The required assets thus not solely determine the specificity of transactions but rather by the capabilities required and the overarching organisational structure. LSP (inst) firms 4 and 15, for example, state that they possess the same equipment as their competitors, but their advantage lies in the specific investments made into employee training, which allows them to offer an all-in-one solution to tackle their customer’s specific supply chain issues.

Monitoring and Negotiation Costs for LSP (inst) Service Provision

Given their very close relationship with the customer and their integration into the entire supply chain, LSP (inst) firms are responsible for monitoring their own activities in order to deliver the required service specifications. LSP (inst) Interviewee 5, for instance, states that “we invest heavily in monitoring [...] and implementing our own processes [...] within [their customer’s] ERP system”. Such behaviour illustrates the responsibility and effort that is expected of this type of service provision. The case firms take on a more integrated role than LSP (out) firms because they are solely responsible for their customer’s supply chain performance. LSP (inst) firm 4 highlight that they possess “advanced GPS and IT systems [in order to] monitor not only transportation but also [...] temperature, pressure and so on”. This shows the LSP (inst) firms’ tendency towards strict and close monitoring activities and whenever it comes to controlling sub-tier providers or suppliers that go beyond the LSP (inst) firm’s boundaries, collaboration efforts and implementation procedures are distinctly and precisely tailored to the LSP (inst) firm’s measurement and monitoring processes.

If we decide to collaborate with another carrier, we need to undergo a long-term process in order to train and certify the carriers for our specific products (LSP (inst) Interviewee 4).

LSP (inst) firms place much emphasis on achieving cost-efficient operations by negotiating prices and rates with subcontractors. Even though the LSP (inst) firms are responsible for monitoring activities, they feel the pressure from their customer to provide cheap services. Hence, the negotiation and leveraging power between LSP (inst) firms and the customer remains with the customer.

Small Numbers Bargaining and Switching Costs for LSP (inst) Service Provision

As was previously mentioned, negotiation power shifts back to the LSP (inst) firm with regard to upstream sub-tier structures because the sub-tier suppliers offer more generic and basic services that are readily available and easily accessible. Small numbers bargaining, however, depends on the nature of the industry and market in which a customer operates. In niche markets, the availability of suppliers and the exploitation of bargaining power differ from case to case. LSP (inst) Interviewee 4 evidences that “we are very limited in what carriers [sub-tier suppliers] we can use. [...] There are about [...] ten to 15 firms in Europe that are trained and capable of doing these transactions”. This

translates into rather high switching and negotiation costs for LSP (inst) firms. Alternatively, LSP (inst) firm 5, whose customer operates in the high-tech and consumer goods industry, can achieve massive economy of scales and benefit from its strong buying power.

We take advantage of our organisation's [i.e. the customers] buying power [...] to negotiate much lower prices. We are talking about massive volumes [...]. We operate up to 27,000 pallets per day (LSP (inst) Interviewee 5).

LSP (inst) firms, therefore, can leverage their power only upstream the supply chain against sub-tier suppliers (i.e. carriers).

4.3.3 Outsourcing Arrangements for LSP (inst) Service Provision

The collaborative relationship between LSP (inst) firms and their customer is highly integrated in terms of supply chain operations and relevant responsibilities. Due to this hierarchical structure, goals are based on mutual agreements. Relational and contractual collaborations with sub-tier suppliers and subcontractors, however, reveal provider opportunism due to the competitive nature of these sub-tier (upstream) relationships. Therefore, logistics outsourcing activities follow usually a behaviour-based arrangement with the customer and an outcome-based one with the sub-tier suppliers (upstream), as supported by the following items of goal incongruences, moral hazard/adverse selection and information asymmetry, inasmuch as they relate to the principal-agent dilemma.

Goal Incongruences for LSP (inst) Service Provision

Achieving common goals is the primary determinant for a satisfactory outsourcing relationship between LSP (inst) firms and their customer, where logistics activities are an integrated part within the customer's (focal firm) organisation.

Due to the corporate structure, our annual profit represents the annual cost savings for him [*sic*] [our customer] (LSP (inst) Interviewee 15).

LSP (inst) case firms do not typically highlight the importance of cost savings *per se*, but rather stress performance indicators that relate to efficient supply chain operations in a cost-driven manner, which benefit both the customer and the LSP (inst) firm. Case firm 4, for example, is responsible for managing all product-related operations in such that satisfies the customer's overall goal of cost-efficiency.

Our customer is only interested in a benchmark price [for the final products]. [...] We act as a supplier for products and our customer wants an all-in-one solution, where we are responsible for delivering [the products] into the stores as cheaply as possible (LSP (inst) Interviewee 5).

Such a close alignment of goals is the key factor for effective LSP (inst) service provision. In this way, cost savings are considered – albeit at times, implicitly – amongst all LSP (inst) cases, as it strengthens their competitive advantage and ultimately benefits the customer.

Information Asymmetry for LSP (inst) Service Provision

In line with the high level of integration and supplier involvement, LSP (inst) firms drive the implementation of IT systems and communication channels in order to increase supply chain visibility. It is thus crucial to obtain accurate and precise information from suppliers and sub-tier carriers. Such data is essential given the sequential procedures followed by such IT systems.

We have incorporated an IT system where the supplier uploads all of the relevant information for the shipment. The logistics carrier [sub-tier supplier] is then notified, which automatically generates a container booking on the vessel (LSP (inst) Interviewee 5).

Facilitating communication along the supply chain, which includes the customer's product suppliers and clients, is a key priority. Case firm 5, for instance, shares information and communicates directly with its customer's global clients to guarantee proper implementation of the information flow and the flow of physical materials.

We invest massively into our IT system. [...] Prior to implementing a store in Spain for example, we need to develop an information technology structure first. [...]. Many other factors, such as import taxes, tolls and customs must be synchronised before we start the actual physical import of the products [...]. The physical transport is the last step in the whole process of internationalisation (LSP (inst) Interviewee 5).

LSP (inst) Interviewee 15 also states that “we coordinate communication with our customer's clients” and as their CEO personally “takes care of [any] problems by myself”. In sum, information asymmetry and supply chain visibility is absolutely essential for LSP (inst) service provision in maintaining efficient and integrated service operations.

Moral hazard and Adverse Selection for LSP (inst) Service Provision

LSP (inst) service provision, as was mentioned above, executes highly transparent supply chain operations where the availability of information and the relevant performance outcomes are fully accessible. Referring to moral hazard, this behaviour is essential to guarantee easier monitoring processes. However, due to the individuated specifications of service requirements, the moral hazard and adverse selection play a major role, mainly with regard to their sub-tier suppliers (carriers). In particular, case firms 15 and 17 claim that their carriers do not know what is requested of the required services and the focal firm's (i.e. LSP (inst) customer) management division does not properly communicate these requirements.

A major issue as to why the bids for our customer's transportation services did not return satisfactory results was due to the fact that our manager could not make it understandable for logistics firms [...]. Even though these were very basic calculations and specifications, no one communicated them properly... [...]; the know-how of translating logistics language into industry language was missing (LSP (inst) Interviewee 15).

A major challenge for LSP (inst) firms, therefore, is to overcome this lack of communication as it pertains to service specification with the sub-tier suppliers and carriers. Hence, LSP (inst) firms tend to be more involved with defining service and operations outcomes towards their customer side. In addition, goal misalignments, prior to a contractual relationship (*ex-ante*) that relate to adverse selection towards sub-tier suppliers, deserve further attention in LSP (inst) service provision.

4.3.4 Systems Integration Capabilities for LSP (inst) Service Provision

The main item contributing to the construct of systems integration capabilities for this archetype of service provision is the interaction with customers and end-consumers. While developments of PSS is rather limited to the customer's product offerings and service specifications, LSP (inst) firms show initiative and develop innovative capabilities in order to adapt to market changes. Consequently, the systems integration capabilities for LSP (inst) service provision are highly exploited, as supported by the following items of customer interaction, development of PSS and adaptation to market changes.

Customer and Consumer Interaction for LSP (inst) Service Provision

Across the investigated LSP (inst) firms, integration with both upstream suppliers and downstream clients and end-consumers were presented. Case firm 5, in particular, places much emphasis on the end-consumer's satisfaction by providing a convenient shopping experience.

We provide an online store where customers can order every product from the [high street] stores. The customer can then decide whether to pick up the product from the local store or get it delivered (LSP (inst) Interviewee 5).

In addition, end-consumers benefit from case firm's 5 distribution network, as they can return and pick-up deliveries at any store in any country. Case firms 8 and 17 also offer these consumer-tailored services, operating online stores, which allows them to provide quick and customised delivery options (to the consumer). These services further benefit the LSP (inst) providers, insofar as they are able to capture and subsequently measure end-consumers' ordering behaviour.

Adaptation to Market Changes for LSP (inst) Service Provision

The close relationships, characterised by this archetype of service provision, do not allow much room for innovation or market adaptation for the provider firms, despite the fact that all interview respondents claimed to be quite flexible and able to readily adapt to market changes. Furthermore, the LSP (inst) firms' broad supply chain operations and wide-ranging logistics activities increases the complexity of innovation dramatically. On the one hand, this complexity favours the LSP (inst) firms in terms of acquiring superior industry knowledge and skills needed to coordinate end-to-end supply chains because they face multiple transportation challenges, for instance.

There are many partners and many operations involved in transportation throughout all of Europe, including different transportation modes, such as rail, road and ships [...]. There are several variables that could cause interruptions [...], and also interruptions that cannot be predicted, which increases the complexity immensely (LSP (inst) Interviewee 4).

On the other hand, this complexity limits provider firms' capabilities of reacting to market changes. LSP (inst) Interviewee 15 makes clear that "we do not offer any e-commerce services [...] and we do not offer warehousing solutions. We only focus on our customer's [products]". These limitations of not facing customer changes quickly through online

channels with the consumers, however, are not necessarily barriers for acquiring a competitive advantage. Case firms 4, 15 and 19, for instance, operate in niche markets, where the all-in-one service offerings to a single customer are precisely what afford the LSP (inst) firms their exemplary statuses.

Products, Service and Systems for LSP (inst) Service Provision

The service solutions offered by LSP (inst) firms are collectively dedicated to a single customer, which increases their ability to bundle and consolidate service operations and activities. It is widely accepted, as is highlighted by LSP (inst) Interviewee 15 that the case LSP (inst) firms “do everything that [the] customer needs, [including] value-adding services [by] bundling several products into one product [solution]”. LSP (inst) firm 5 goes beyond offering the conventional logistics services to include sourcing and procurement activities within their service portfolio.

We cover the sourcing function [...], which includes ... for example, we look at the Asian market for similar or benchmark products, and if we like one [and] we decide our customer needs that as well, we approach the suppliers directly and negotiate the price with them. Afterwards we approach our logistics department and undertake the steps for importing the products (LSP (inst) Interviewee 5).

In this way, LSP (inst) case firms may act independently to develop unique sourcing operations, to address their customer needs. This high level of developing customised services, however, is limited to the requirements of just a single customer and would not be feasible at an industry-wide level.

4.4 Logistics Service Integrators

Given the trend towards internationalisation and emphasis placed on global sourcing strategies, logistics operations have become increasingly more complex. Correspondingly, global supply chains, networks and systems have ultimately led to the emergence of systems sellers and systems integrators. Such logistics service integrators (LSI) are responsible for integrating and coordinating supply chain wide operations that span beyond conventional transportation, distribution and order management services, and also include the consideration of supplier and customer interactions. This archetype is represented by an amalgam of the case firms **9**, **13** and **14** from the investigated sample in this study. These LSI firms primarily operate in retail, fashion or high-tech industries, all of which are growing at a fast rate, imply rapidly changing consumer behaviour and

involve intense end-consumer interactions via online purchasing and e-commerce. Generally, operations within this archetype of service provision are much more strategic as opposed to operational or transactional. The key role of LSI firms is to connect and integrate all partners along a supply network, focusing particularly on customer and end-consumer satisfaction. Table 4.5 summarises the firms allocated to the archetype of LSI service provision in this thesis.

Firm No.	LSI Service Provision Characteristics	Fixed Assets / Revenue in EUR p.a.
9	Full supply chain solutions include sourcing, replenishment, material handling, packaging, delivery, return logistics of FTL and LTL shipments, as well as customer service responsibilities. Customer base includes global fashion retailers, household and appliances, and the leisure industry.	21 national and seven international offices. Annual Revenue 227.7 mn.
13	Global distribution of print media and books includes warehousing, return delivery, strategy planning and financial services as well as IT services. Customer base in consumer goods and print industry, B2B and B2C.	> 70,000 employees; global branches in 40 countries. Annual Revenue 4.7 bn.
14	Full supply chain coordination and provision of B2C and B2B solutions, includes operating and managing online shops, customer service, and IT implementation. Customer base in fashion and high-tech industries.	110 global offices in 60 countries; operating (not owning) >200 logistics facilities. Annual Revenue 19.1 bn.

Table 4.5: Case Firms' Characteristics LSI Service Provision

All of the investigated LSI firms possess similar characteristics, especially with regard to their customer base and distribution operations, where “we offer a complete solution [...] from the internet portal to the logistics functions ... transportation, including financing and payment schemes” (LSI Interviewee 13). Figure 4.4 summarises each case firm's characteristics within the archetype of LSI service provision.

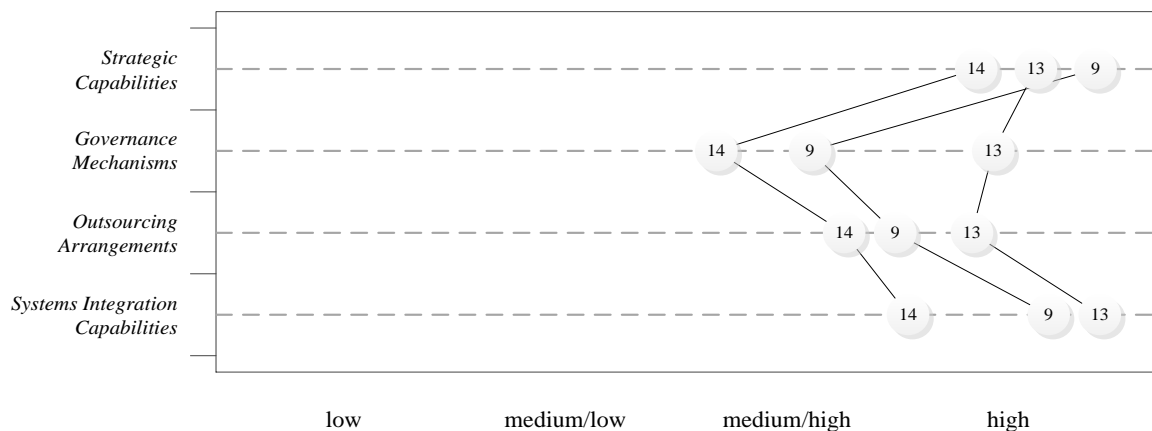


Figure 4.4: Empirical Evaluation of LSI Service Provision

The following subsections present the case study findings that are based on the interpretation and analysis of the interviews that represent the archetype of LSI service provision, regarding strategic capabilities, governance mechanisms, outsourcing arrangement and systems integration capabilities. Furthermore, Figure 4.4 summarises each of these empirically evaluated constructs, as they pertain to the LSI archetype of service provision.

4.4.1 Strategic Capabilities for LSI Service Provision

Traditionally, systems integrators in logistics are characterised by the absence of physical assets and resources. Accordingly, LSI firms typically do not own logistics related assets, such as vehicle fleets, warehousing or any other transportation units.

We don't have our own assets or distribution networks. We subcontract everything to external service providers (LSI Interviewee 13).

The primary focus amongst LSI firms, in this sample, is put on cultivating relational and organisational capabilities that allow for more efficient coordination and management of the entire supply chain. While these LSI firms are unable to control operational activities (e.g. upstream transportation or collection) through the possession of privately owned assets by sub-tier carriers, their strategic capabilities are highly advanced, due to the emphasis place on relational and organisational factors. These factors ultimately contribute to their competitive advantage and represent the key capabilities that facilitate integrated services solutions as discussed below.

Physical Assets for LSI Service Provision

Contrary to the prior assumptions formulated about this archetype of service provision, the investigated LSI firms in this thesis did own and manage some physical assets. LSI firm 9, for instance, owns “four distribution centres [...] and six logistics facilities and we have around 150 own vehicles”. Case firm 13 only owns warehouses and distribution centres, but does not possess their own vehicles because their “services are too complex and unique to reproduce [*sic*] [administer] them with [own assets]” (LSI Interviewee 13). LSI firm 14 also owns warehouse facilities, but in addition “we provide special equipment [...], such as washing machines and so on ... we do chemical tests and other quality checks”. Hence, physical assets are present, but to a much lesser extent than the other three archetypes of service provision. Typically, when LSI firms possess their own assets,

they are used to provide specialised and /or unique service offerings. Peripheral assets, such as IT systems, technological advanced software tools and online portals, however, play a crucial role in defining this archetype's competitive stance.

We do not have any of our own container equipment or assets, such as ships [...] or vehicles, but our IT system is the single most important [asset] that we possess (LSI Interviewee 14).

Relational Capabilities for LSI Service Provision

The archetype of LSI service provision places most of its attention on developing its relational capabilities. Notably, the relational governance structure and the length of contracts with sub-tier suppliers, providers and carriers do not dramatically differ from those collaborative relationships evidenced amongst LSP (out) and LSP (inst) firms. Relational governance is typically very long and based on trust and mutual agreements.

Most of our clients are lifelong customers, for example, we have worked with [a retail chain] since 1952. We focus on long-term relationships and aim to build strong collaboration (LSI Interviewee 9).

LSI case firm 14, on the other hand, engages also in relatively short-term and basic contractual relations with their customers as “we offer basic freight services [...] to smaller customers on a daily basis” (LSI Interviewee 14). However, LSI firm 14 states that even though they renew their contracts on a yearly basis, they make sure that they still have “full visibility over our customer's supply chain [i.e. all operations]” (LSI Interviewee 14). Relational capabilities may not necessitate a long-term contract in this case, but nonetheless play a crucial role in guaranteeing full supply chain integration.

We are entirely responsible [...] for our customers' operations [...] and the carriers and suppliers communicate with us directly. [...] We operate in the name of our customers (LSI Interviewee 14).

A critical difference between LSP (inst) firms, therefore, lies in the perception of coordinating these relationships. Here, emphasis is not placed solely on the contracts themselves (as opposed to LSP (inst) firms), which comes across somewhat surprising, given the abstract and transcendent nature of integrator firms. However, opposed to LSP (inst) services, LSI firms oversee many more supply chain related operations, which explains why their key competency lies in their ability to manage such complex systems-wide interactions, especially downstream interactions that focus on end-consumers.

Organisational Capabilities for LSI Service Provision

The general absence and low impact associated with owning equipment and assets, such as transportation units and warehouse facilities, indicates the strong organisational capabilities amongst LSI firms. All three case firms in this sample have advanced connections with their sub-tier suppliers (i.e. carriers), which enables full supply chain integration (emphasis here is upstream integration).

We subcontract operations to carriers [...] and we coordinate 1,000 vehicles every day. We exploit our carriers' network and distribution capabilities, for example, CEP services (LSI Interviewee 9).

LSI firms often collaborate with other LSP (out) and even LSC firms. For example, LSI Interviewee 13 states that "we collaborate with other major logistics firms [i.e. LSP (out) firms] as well, when we, for example, distribute automotive elements to South Africa". In order to coordinate and organise holistic supply chain and wide operations, LSI firms implement an institutional hierarchy, which involves several business units that are responsible for different functions in of the customers' supply chain.

We have an internal logistics department. Most of our customers are internal, where we integrate logistics and warehousing activities. Our different departments represent separate business units [...] that communicate and collaborate with each other (LSI Interviewee 13).

Such a hierarchical (institutional) structure is further supported by LSI Interviewee 14, who states that "we also have a business unit that is called 'operations', where we deal with smaller customers and offer basic [...] freight services, similar to that of any other logistics firm". This demonstrates that LSI firms have strong organisational capabilities, due to their institutional structure of functional business departments.

Knowledge and Training for LSI Service Provision

Knowledge development and the provision of industry specific know-how, amongst LSI service provision, are both very strategic and tactful. LSI firm 14, who stresses the need to bring forward such advanced industry knowledge, evidences this.

We developed a lot of know-how in integrating different systems into one system [...] and it requires a lot of know-how to run these systems without errors or problems (LSI Interviewee 14).

Such a high level of know-how, in terms of supplier and customer integration, is maintained through the continuous training of staff and employees. LSI firm 13 employs functional experts for distribution, warehousing and customer service enquiries. Case firm 9 hires specialists in the fashion industry in order to continuously guarantee high quality standards of their services. This type of knowledge development results in strong organisational capabilities, which ultimately lead to a competitive advantage.

We guarantee customer retention by being the only firm that can offer integrated [fashion retail] solutions (LSI Interviewee 14).

In addition, LSI firms train their customers to use IT systems and encourage supplier involvement, as was evidenced by case firms 13 and 14, who attempted to provide guidelines, such as training or instruction standards, as a strategic starting point for the provision of systems-specific knowledge.

4.4.2 Governance Mechanisms for LSI Service Provision

Amongst LSI firms, governance mechanisms are reflected via the integration of multiple partners across a network of supply chains. While transaction specificity and uncertainty are generally presumed to determine the contractual or relational governance form, LSI firms focus on the monitoring and *ex-post* operations that result from collaborative relationships and contractual agreements with multiple partners. The risk of opportunistic behaviour, therefore, is the LSI firm's major concern in providing solutions to the final customer or end-consumer. Consequently, governance mechanisms for LSI service provision are highly employed, as is supported by the items of uncertainty/frequency, asset specificity, monitoring/negotiation and small numbers bargaining.

Uncertainty and Frequency of Transactions for LSI Service Provision

The strategic orientation of LSI service provision indicates that transactions on a more operational level are of little concern for the case firms. The management and coordination of these (supply chain wide) operations is thus transferred to sub-tier suppliers (i.e. providers or carriers). LSI firm 14, for instance, takes responsibility for demand fluctuations and has the capabilities to respond to these due to its hierarchical sub-tier structure, where the firm has access to multiple carriers.

We consolidate our customers' suppliers' orders in the country of origin. [...] If the supplier doesn't have enough volume for a FCL, we consolidate it in our [...] container freight stations (LSI Interviewee 14).

The actual processes, however, are not managed by the LSI firms themselves, but by their external (sub-tier) partners (i.e. upstream). This allows LSI firms to focus extensively on interactions with their (downstream) customers and end-consumers, which leads to very predictable and stable operations (because demand can be anticipated more accurately) on a larger scale. LSI Interviewee 14, for example, highlights the fact that "we consider special deadlines or time windows [...] to ship or collect a customer's merchandise".

In conclusion, even though operational uncertainty might occur, due to seasonal demand fluctuations or variations in commodity prices, for example, uncertainty is generally not a concern for this archetype of service provision. LSI firms aim to increase the frequency of transactions as much as possible by interacting with downstream customers (and preferably end-consumers). This is mainly achieved by their ability and the ease to access real-life sales data (i.e. ePoS) and the anticipation of actual demand and consumption, which enables the LSI firms' sub-tier suppliers (providers and carriers) to organise and implement their operations more efficiently and effectively.

Transaction Asset Specification for LSI Service Provision

In order to define the specificity of transactions and assets amongst LSI firms, two distinctions need to be made. First, the high specificity of physical assets renders specialised integrator firms, based on a hierarchical governance structure, necessary. Second, the specificity of transactions, in the form of communication and organisation capabilities, is related to the provision of highly complex and unique IT systems and integration capabilities. LSI firms 9 and 13 highlight the importance of providing specific assets by stating the "our competitive advantage [...] is based on our unique trailers and transportation units within the fashion industry" (LSI Interviewee 9) and that "it is not very easy to get a certificate that qualifies [the carriers] to transport pharmaceuticals [...] and also they [the carriers] need the specific equipment" (LSI Interviewee 13).

Monitoring and Negotiating Costs for LSI Service Provision

Monitoring ongoing processes and operations are essential in LSI service provision. Particularly, post-contractual and relational measurement activities, such as product tracking and tracing practices, are highly indicative of LSI firms' performance outcomes.

We monitor them [the carriers] very closely [...] and all events [i.e. transactions] are scanned [...] so we know when and where the products are in order to avoid [...] punishment payments [i.e. late fees] (LSI Interviewee 9).

Such precise monitoring techniques ultimately contribute to the satisfaction of the LSI firm customers' end-consumers. LSI firm 14, for instance, has a separate functional department that coordinates and controls all logistics activities in terms of quality.

We can provide specific reports [...] showing, for example, how many containers were operated by certain carriers or how frequent do the suppliers [the customer's supplier] order (LSI Interviewee 14).

Even though such ratios seem quite basic, LSI firms take them seriously. As is evidenced by LSI firm 14, these ratios are crucial, especially in early contract/bidding phases with customers. In this way, later fees and expected performance outcomes are addressed.

That means, we are responsible for, more or less, operating at a certain performance level. If we cannot achieve it [this expectation], there will be consequences [...], of which are decided on an individual basis (LSI Interviewee 14).

Small Numbers Bargaining and Switching Costs for LSI Service Provision

LSI firms enjoy strong buying power (against the upstream sub-tier suppliers and service providers) given their customer-tailored and specialised service provision that services a multitude of high volume accounts across different industries.

We operate in a market where there are not thousands of [...] competitors, as it is the case for conventional transportation services. [...] We are more specialised [and our services] are associated with high investment [costs]. (LSI Interviewee 14)

These high investment costs, as they relate to service provision and supply chain integration, lead to high switching costs for the customer, as is explained by LSI firm 14.

If our customers switch their provider, they face new costs and initial investments, because they have to develop everything from scratch with another provider firm (LSI Interviewee 14).

LSI firms 9 and 13 also benefit from such enhanced buying power as “we aim to sell as many services to our customers as possible in order to reduce the risk of being substituted” (LSI Interviewee 9). In addition to the high investment costs, LSI firms purchase basic

logistics services offered by the sub-tier suppliers, whose bargaining power is relatively low. Sometimes, LSI firms even exploit these capacities by acquisitions and takeovers. LSI Interviewee 13, for example, states that “there are many providers that offer CEP services” and LSI Interviewee 9 supports this argument by commenting that “it is very easy to switch suppliers and find a different carrier”. In sum, high investments required of customers and low bargaining power of sub-tier suppliers results in the high bargaining power enjoyed by LSI firms.

4.4.3 Outsourcing Arrangements for LSI Service Provision

Intimate collaborations and outsourcing arrangements are crucial to the archetype of LSI service provision. Goal incongruences and information asymmetry tend to play a minor role in collaborative efforts made amongst LSI firms and their sub-tier suppliers. However, the downstream interaction with the customers and end-consumers requires greater emphasis on goal alignment and thus necessitates a reduction of information asymmetry. Given that this archetype of service provision places much emphasis on customer and end-consumer satisfaction, LSI firms stress the need to share information and align goals in order to meet shared performance outcomes. In this way, and despite the disparity between upstream and downstream alignment efforts, LSI firms are perceived as the main drivers for collaboration. This distinction between the alignment efforts of upstream and downstream related goals and information, therefore, is still perceived as very high. LSI firms place much more emphasis on the sharing of information and are seen as the drivers for collaboration and, therefore, are perceived as very high. The following items of goal incongruences, information asymmetry and moral hazard/adverse selection are expanded on below.

Goal Incongruences for LSI Service Provision

Amongst LSI firms in this sample, goal incongruences (i.e. the misalignment of performance outcomes) were not identified as greatly impacting the provision of integrated services. Due to the collaborative structure of multiple partners, LSI firms tend to transfer their performance measurement responsibilities upstream, to the sub-tier providers. Insofar as these sub-tier providers have no incentive to behave opportunistically – and given the competitive nature of lower level logistics services – they are willing to bear risks in order to serve the LSI firms. In a similar vein, downstream customers (i.e. buying firm) are not heavily involved with measuring performance

outcomes nor the monitoring or coordination efforts associated with service solutions. Hence, downstream interaction is implicit and mainly takes place between the LSI firm and the end-consumer, with regard to meeting customer-specific objectives, such as meeting sales forecast etc. Case firms 9 and 14, in particular, provide a sophisticated and exhaustive order management and procurement platform for their customers (i.e. buying firm). In this way, it is in the customers' best interest to transfer all responsibility to the LSI firm, which guarantees satisfactory performance.

All operations are linked to a central IT system. [...] Our customer [...] always knows where the products are. [...] Disruptions are reduced in terms of keeping deadlines and guaranteeing a smooth flow throughout the supply chain (LSI Interviewee 9).

By shifting all of the responsibility to the LSI firm, goal incongruences are no longer relevant and the chance for opportunism (from the customers) is essentially eliminated.

Information Asymmetry for LSI Service Provision

As was previously mentioned, LSI firms act as the primary drivers for sharing information, which enables them to offer service solutions for the entire supply chain. This archetype of service provision stresses the continuous and un-interrupted flow of information and products. LSI Interviewee 13, for instance, values that "our information system includes the entire order management, tracking [...] and all relevant interactions". Furthermore, LSI firm 14 frequently highlights their "unique selling point of providing full supply chain visibility [i.e. transparency]". Indeed, such practices can only be realised if all partners are willing to share information with one another, as is demonstrated by LSI firm 14, which manages to coordinate both upstream and downstream supplier and buyer related information. "[Our customer] shares their purchasing order data with us [...] which then is part of our booking system". Furthermore, supply chain wide suppliers are linked to the LSI firm's management platform that enables "suppliers [...] access to all purchasing order data and the booking system" (LSI Interviewee 14).

Moral Hazard and Adverse Selection for LSI Service Provision

The LSI firms in this thesis collectively mitigate the risk associated with moral hazard and adverse selection by offering a wide range of supply chain solutions. In addition, customers have full transparency over the LSI firms' processes and capabilities, with regard to selection of sub-tier suppliers and monitoring their performance.

Our customers know that we can offer them all solutions along the supply chain. But they could, if they wanted to, source separate operations from different suppliers separately (LSI Interviewee 9).

Case firms 13 and 14, who “offer different services to customers [...] and we highlight the advantages and disadvantages for each [service], we therefore give customers a choice” (LSI Interviewee 13) further illustrate such transparency. Furthermore, as demonstrated by case firm 14, moral hazard issues are mitigated through the increasing efforts of service transparency.

We take into account our customers’ requirements in order to know what [...] they want and to know to what extent we can offer our standard products to them [the customers]. (LSI Interviewee 14)

Due to the transparent communication of service offerings, underpinned by specific and transparent operating procedures, customers know exactly what their providers (and the sub-tier suppliers) do and what are capable of, at any time during their contractual relationship. Hence, opportunism is not evident and rarely occurs amongst LSI firms.

4.4.4 Systems Integration Capabilities for LSI Service Provision

As was evidenced, LSI service provision spans beyond standard logistics practices and activities, such as distribution, warehousing, material handling and packaging. The key feature of this archetype of service provision lies in its ability to coordinate multiple functions across the entire supply network. LSI firms focus on the integration of information systems and act as an umbrella organisation that connects end-consumers’ requirements (mostly in the form of demand) with the logistics and purchasing activities of all partners within the focal firm’s supply network. The processes of integrating end-consumers with the focal firm (i.e. the buying firm of service solutions) and its suppliers are highly advanced and are not bound to any particular industry or service. Consequently, the systems integration capabilities for LSI service provision are very advanced. This is supported by the items of customer interaction, development of PSS and adaptation to market changes, as described below.

Customer and Consumer Interaction for LSI Service Provision

The integrator role that LSI firms adopt results in continuous and frequent interactions with end-consumers. In order to accurately gauge consumer behaviour and recognise demand fluctuations as soon as they occur, this archetype of service provision emphasises

its ability to coordinate and align consumers' requirements with the LSI firms' service offerings. Due to their strong relational and organisational capabilities, as was mentioned previously, LSI firms are able to operate with both B2B and B2C clients simultaneously and can therefore increase the frequently claimed supply chain visibility and transparency. LSI firm 13, for instance, engages in a high degree of both upstream supplier (B2C) and downstream customer (B2B) interaction.

We offer A to Z services [...] because the retailer [our customer] has outsourced its warehousing to us, we organise and coordinate the transportation services as well. [...] We also [...] manage and run the [retailers'] online shop [i.e. face end-consumers] (LSI Interviewee 13).

LSI firm 13 further affirms that it relies on communication infrastructure with end-consumers in order to coordinate their upstream supply management, including replenishment, ordering, warehousing and transportation operations. All three LSI firms in this sample focus on the implementation of IT and telecommunication systems in the form of online shops and/or supplier platforms. Therefore, the continuous information flow is guaranteed given that this service provider starts at the very most downstream point of the supply chain, that is, with consumer data collected via EPoS data.

We see ourselves as a lead logistics provider. [...] Our core competence is the provision of platform solutions, which increases supply chain visibility (LSI Interviewee 14).

Adaptation to Market Changes for LSI Service Provision

Market adaptation and the ability to react quickly to changing customer requirements, in terms of fluctuating demand and volatile buying behaviour, ultimately determines the performance amongst LSI firms. All LSI firms in this sample actively focus on developing a customer-centric approach, which distinguishes this archetype of service provision from those of LSP (out) and LSP (inst) firms. LSI firm 9, for example, records and closely analyses backward deliveries (i.e. return rates) from consumers to retailers.

Return ratios are very high, which favours our operations, because we can then offer more value-adding services. [...] For example, we unfold, unpack, d quality control, wash and repack. [...] We more or less prepare the returned [clothing] so that they are 'ready for sale' again (LSI Interviewee 9).

In addition to monitoring backward material flows, LSI firm 9 translates these operations into value-adding services: “We try to offer value-adding services to our customers in order to better compete [in that market]” (LSI Interviewee 9). Consequently, such services enhance their competitiveness compared to other LSI firms and illuminate their ability to adapt to volatile buying behaviour. Furthermore, backwards supply chain operations that are closely aligned to end-consumers ultimately increase “the opportunity to better control and coordinate [customers’] supply chains”, as stated by LSI Interviewee 14.

Products, Service and Systems for LSI Service Provision

LSI firms in this sample are known for bundling, as well as managing and coordinating services and service solutions that consider multiple supply chain operations.

We undertake both procurement logistics and distribution logistics [...] starting from the production of the product, [...] delivery of the [raw materials], [...] consolidate and tailor the products [...] and the final distribution to the retail stores (LSI Interviewee 9).

In addition to these logistics and procurement related operations, its service offering also includes quality control of raw materials. Thus, the transparency of services offered empowers customers to choose any service that suits them, highlighting the fact that customers only use what they actually require. Including supplementary value-adding services, provides customers with the opportunity to enhance their ongoing service operations. As eloquently summarised by LSI Interviewee 9, the customers “have at least the option of an all-in-one supply chain solution”. LSI Interviewee 13 states that they also extend conventional logistics services by offering “different services and business units, [such as] e-commerce to different industries, [i.e.] pharmaceuticals and health care [...], automotive [...], publishing and entertainment [...] and telecommunication or smartphones”. In this way, LSI firm 13 is not limited to a specific industry or a concrete product portfolio, but can vertically integrate their services across a multiplicity of supply chains, such as fashion retail, automotive, insurance, banking and pharmaceuticals, for example. In a similar vein, LSI Interviewee 14 states that they offer their customers “customised and individual solutions, IT solutions”. These customised solutions increase the supply chain visibility for the particular customer. LSI Interviewee 14 also states that “customers do not want to approach each of our individual partners [i.e. sub-tier supplier or provider within their supply chain], they want a single system that grants them full supply chain visibility”. In sum, the archetype of LSI service provision is primarily

concerned with making its complex operations fully transparent to the customer, which, in turn, empowers customers to make fully informed choices and purchase value-adding services when deemed appropriate.

4.5 Summary of the Within-Case Analysis

The following subsections summarise the findings from the within-case analysis resulting from the interpretation of the interview responses. Additionally, the boundaries defining the four archetypes of service provision are identified, following the initial conceptual framework and evaluation of the relevant theoretical constructs.

4.5.1 Empirical Characteristics for LSC Service Provision

Drawing on the above analysis of the interviews pertaining to the archetype of LSC service provision, the following Table 4.6 presents the empirical evaluation of the theoretical constructs that are based on the initial conceptual framework. These findings also enhance the initial assessment criteria of service boundaries outlined in Table 4.1.

LSC	Evaluation	Supporting Findings	Limiting Characteristics
<i>Strategic Capabilities</i>	Medium (high)	<ul style="list-style-type: none"> Ownership of assets and resources for basic logistics activities remains within the LSC firm. External resources are typically not required for LSC service provision. 	<ul style="list-style-type: none"> Resources are not scarce or inimitable. Relational capabilities are limited to dyadic relationships and spot market transactions. Little know-how and knowledge required for LSC services.
<i>Governance Mechanisms</i>	Very low (low)	<ul style="list-style-type: none"> Assets can be acquired at low costs; LSC firms are able to easily adapt to demand fluctuations. Low prices and service rates, easy for customers to switch providers. 	<ul style="list-style-type: none"> Buyers can exploit assets very easily. Provider firms have low bargaining power. Firms focus on privately owned asset utilisation.
<i>Outsourcing Arrangement</i>	Medium (low)	<ul style="list-style-type: none"> Information is readily available and easily accessible. Risk of adverse selection is limited due to the basic and standardised nature of LSC service provision. 	<ul style="list-style-type: none"> Not willing to share information. Providers are highly opportunistic. LSC firms suffer from information asymmetry and little supplier involvement.
<i>Systems Integration</i>	Very low	<ul style="list-style-type: none"> Strong focus on increasing asset utilisation solely. Activities are easy to link with customers' IT systems. 	<ul style="list-style-type: none"> No interaction with end-consumers. No offerings of integrated services or system solutions.

Table 4.6: Supporting and Limiting Characteristics for LSC Service Provision

Strategic capabilities, in terms of physical and relational resources, are highly important to the archetype of LSC service provision, mainly because this is their only source of a competitive advantage. Decisions on governance forms are neglected because transactions are conducted on the spot market, following arm's-length relationships.

Outsourcing arrangements, however, are slightly more important, due to the availability of information that can potentially lead to an increase of bargaining power for LSC firms. Systems integration capabilities are not employed at all, as they do not contribute to the service offerings within the scope of LSC service provision.

4.5.2 Empirical Characteristics for LSP (out) Service Provision

This section offers a summary of the empirical data as it relates to the archetype of LSP (out) service provision. Table 4.7 summarises the supporting and limiting characteristics that pertain to the theoretical constructs based on the initial conceptual framework in order to support the definition of LSP (out) service provision.

LSP (out)	Evaluation	Supporting Findings	Limiting Characteristics
<i>Strategic Capabilities</i>	Medium (high)	<ul style="list-style-type: none"> • Exploitation of privately owned and shared assets and resources. • Large scale and scope of operations. • Strong collaborative relationships and relational capabilities. • Well-established organisational structure and corporate culture. 	<ul style="list-style-type: none"> • Specific assets are costly to acquire. • Assets are not scarce and easily imitable. • Arm's-length relationships are common. • Know-how can be imitated easily because training of staff is easy.
<i>Governance Mechanisms</i>	Medium (high)	<ul style="list-style-type: none"> • Capacities are used to balance out demand fluctuations and uncertainty. • Economies of scales are achievable. • Buying power of provider firms is rather high against upstream carriers. 	<ul style="list-style-type: none"> • Even operations within a niche are competitive. • Provider has little supplying power against industry customers.
<i>Outsourcing Arrangement</i>	Medium (low)	<ul style="list-style-type: none"> • Providers aim to reduce information asymmetry. • Operations are standardised and transparent. • Performance is easily measurable. 	<ul style="list-style-type: none"> • Customers are not willing to share information. • Only basic data is available. • Sub-tier suppliers and providers show opportunistic behaviour.
<i>Systems Integration</i>	Medium (low)	<ul style="list-style-type: none"> • Providers employ upstream integration with producers and industry OEMs. • Providers offer additional services. 	<ul style="list-style-type: none"> • Provider firms do not engage in interaction with end-consumer or downstream supply chain partners.

Table 4.7: Supporting and Limiting Characteristics of LSP (out) Service Provision

Strategic capabilities are slightly more advanced for LSP (out) service provision than for LSC service provision, given their focus on large-scale operations and the simultaneous coverage of several industries. Governance mechanisms are typically comprised of dyadic market relationships but entail more operations than it is common in traditional arm's-length relationships (as is the case for LSC firms). Outsourcing arrangements, on the other hand, are less important for LSP (out) service provision, due to the opportunistic

behaviour of sub-tier suppliers and carriers, which hinders the integration of information flows. Finally, their systems integration capabilities are also quite limited and are barely employed; as the findings revealed this archetype attempted to integrate upstream and downstream interactions and occasionally offered additional and bundled value-adding products and services.

4.5.3 Empirical Characteristics for LSP (inst) Service Provision

The following Table 4.8 presents the empirical evaluation of the theoretical constructs that are based on the initial conceptual framework as they apply to the archetype of LSP (inst) service provision.

LSP (inst)	Evaluation	Supporting Findings	Limiting Characteristics
<i>Strategic Capabilities</i>	High	<ul style="list-style-type: none"> Partly owned assets and resources. Larger scale operations increase competitive advantage for providers. Advanced knowledge and know-how about industry and competitors. 	<ul style="list-style-type: none"> Limited to internal operations of a single customer. Limited ability to exploit external resources.
<i>Governance Mechanisms</i>	High (very high)	<ul style="list-style-type: none"> Very specific equipment and assets for internal customers required. Easy monitoring of operations that proves valuable for superior supply chain performance. Switching costs (for customers) are high, favouring LSP (inst) firms. 	<ul style="list-style-type: none"> Uncertainties and frequency of operations difficult to manage. Costly to acquire external resources and partners. Institutional hierarchy is costly. High negotiation costs and budget planning.
<i>Outsourcing Arrangement</i>	High	<ul style="list-style-type: none"> Little to no information asymmetry present. Emphasis on goal alignment results in efficient operations. Transparent operations and frequent communication of performance objectives 	<ul style="list-style-type: none"> Opportunistic behaviour of LSP (inst) firms and sub-tier suppliers. Information sharing limited to internal partners.
<i>Systems Integration</i>	High	<ul style="list-style-type: none"> Mostly upstream but also downstream integration present. Solution driven approach via advanced large-scale services and operations. 	<ul style="list-style-type: none"> Integrated services limited to internal functions and departments. Only the customer drives performance objectives, and mainly delegates end-consumer interaction.

Table 4.8: Supporting and Limiting Characteristics of LSP (inst) Service Provision

The archetype of LSP (inst) service provision primarily emphasises hierarchical governance mechanisms, due to the high specificity of assets and transactions involved in daily operations. Strategic capabilities are also essential given the large-scale operations that are conducted by a single LSP (inst) firm. With regard to outsourcing arrangements, LSP (inst) firms foster a very close relationship with their customer; this helps to reduce the risks associated with moral hazard and adverse selection offsets any opportunism. While they are continuously developing their systems integration

capabilities, at present, these are not necessarily advanced. Due to the narrowed scope of their operations and given their focus on a single customer, the customer, rather than the provider firm itself, primarily drives such SI capabilities and innovations. However, interaction with end-consumers is encouraged, which shows attempts for a potential development of products, service and systems.

4.5.4 Empirical Characteristics for LSI Service Provision

The following Table 4.9 summarises boundaries for the archetype of LSI service provision amongst the investigated case firms in this sample regarding the theoretical constructs derived from the initial conceptual framework.

LSI	Evaluation	Supporting Findings	Limiting Characteristics
<i>Strategic Capabilities</i>	Very high	<ul style="list-style-type: none"> • Close and continuous relationship with various large-scale service providers. • Advanced IT know-how and industry knowledge. • Strong emphasis on employee training and knowledge exchange. 	<ul style="list-style-type: none"> • Little or no privately owned physical assets or resources limits flexibility (short-term). • Generalisability of service offerings and replication of capabilities difficult.
<i>Governance Mechanisms</i>	Very high	<ul style="list-style-type: none"> • LSI firms benefit from bargaining power, due to large-scale and scope of operations. • Monitoring costs and negotiation costs reduce risk of opportunistic behaviour. • Reduced uncertainty and increased predictability of demand. 	<ul style="list-style-type: none"> • Acquisition of specific assets and resources costly and difficult. • Dependent on sub-tier structure and market relationships.
<i>Outsourcing Arrangement</i>	Very high	<ul style="list-style-type: none"> • Opportunistic behaviour (of customers) very limited, due to the alignment of goals. • Information transparency allows for reduced risk associated with moral hazard and adverse selection. 	<ul style="list-style-type: none"> • Information transparency present but costly to maintain and achieve. • Performance depends on accuracy of data and sub-tier suppliers' willingness to share information.
<i>Systems Integration</i>	Very high	<ul style="list-style-type: none"> • Interaction with end-consumer improves supply chain performance and efficiency objectives. • Provider firms aim to achieve mass customisation. • Provision of full service solutions is unique. 	<ul style="list-style-type: none"> • Customised solutions do not consider standard and low-level operations. • Integration of entire systems increases the complexity of operations and interactions, which results in high monitoring costs. • Multiple partners within a supply network increase the risk of supply chain disruptions.

Table 4.9: Supporting and Limiting Characteristics of LSI Service Provision

The empirical analysis of the case interviews revealed that all interested constructs completely contribute to defining the archetype of LSI service provision. Strategic capabilities generally consider relational and organisational factors as well as the intangible resources, such as specific industry expertise and knowledge about consumer

behaviour, as opposed to the simple provision of physical assets. Governance mechanisms are characterised by the LSI firms' high bargaining power against sub-tier suppliers and their ability to reduce suppliers' opportunism. In terms of outsourcing arrangements, LSI firms place great emphasis on the provision of transparent operations and focus on ensuring an end-to-end information flow, which connects upstream manufacturers and producers with downstream retailers and end-consumers. Finally, and most crucially, systems integration capabilities are represented by the provision of full service solutions and the LSI firms' ability to integrate a multiplicity of supply chains and logistics operations, simultaneously. In this way, the archetype of LSI service provision acts as an umbrella organisation that allows for the production of mass-customised services and results in the provision of PSS. Hence, customers benefit from such holistic LSI operations, especially in large-scale fashion and retail industries where mass-customisation is highly demanded, due to the volatile end-consumers' requirements.

4.5.5 Summarised Assessment of Different Archetypes of Service Provision

The evaluation of the constructs as they pertain to each of the four archetypes of service provision serves as the basis for the cross comparison, as is discussed in the following chapter five. The within-case findings can be summarised as is presented below, in Table 4.10.

Theme / Construct	LSC	LSP (out)	LSP (inst)	LSI
<i>Strategic Capabilities</i>	Medium (High)	Medium (high)	High	Very high
<i>Governance Mechanisms</i>	(Very low) low	Medium (high)	High (Very High)	Very high
<i>Outsourcing Arrangements</i>	Medium (Low)	Medium (Low)	High	Very high
<i>Systems Integration Capabilities</i>	Very Low	Medium (low)	High	Very high

Table 4.10: Summary of Within-Case Findings

CHAPTER FIVE:

CROSS COMPARISON OF SERVICE BOUNDARIES

The purpose of this chapter is to provide a cross comparison of relevant theoretical constructs (i.e. strategic capabilities, governance mechanisms, outsourcing arrangements and systems integration capabilities) across the four proposed archetypes of service provision. The previous chapter described the constructs as they pertain to each archetype; this chapter furthers the analysis by comparing and contrasting the findings from each of the four archetypes. The following sections thus consider the variations amongst the within-case findings to identify the boundaries for each archetype of service provision. The chapter ultimately contributes to addressing research question four:

Research Question Four: *How can the boundaries of different archetypes of service provision be delineated?*

Thus, the following cross comparison shows the impact of each construct from the initial conceptual framework across the four archetypes of service provision in order to gauge the changing behaviour of service providers and their overlapping service boundaries. Furthermore, such a comparison provides insight into the relative importance of each construct across each archetype of service provision. The focus here lies on the *relative* importance in the form of its impact on the providers' perspective of service boundaries. By classifying the importance of each construct per archetype (high, medium and low), this cross comparison allows for the development of a service provision continuum that contributes to bettering the understanding of organisational behaviour within the context of logistics systems.

The evaluation of the respective constructs, however, does not follow a scientifically derived scaling process, but rather highlights how different archetypes of service provision are classified based on a continuum of various themes, given the relative impact of the interested constructs.

5.1 The Role of Strategic Capabilities across Service Provision

Drawing on the case observations and interviews that comprised the narrative of a within-case analysis, Figure 5.1 compares the relative impact of strategic capabilities across the four archetypes. The construct, derived from RBV theory, are organised based on their relative importance with regard to each firm archetypes' competitive advantage, as it relates to the provision of different types of services.

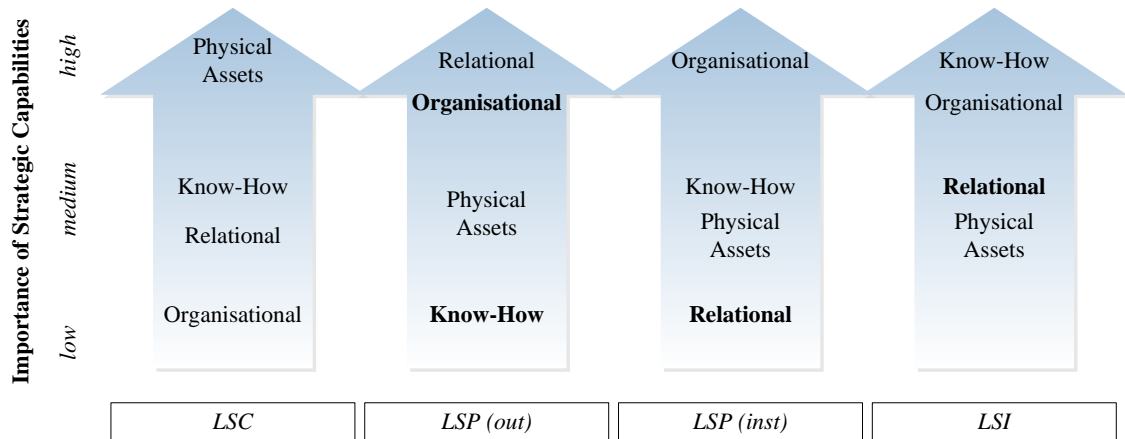


Figure 5.1: Comparison of Strategic Capabilities across Service Provision

According to RBV theory, only those resources and capabilities that can be exploited to a degree, where they add more value to an organisation than they add to any other organisation are perceived as highly important.

5.1.1 Evaluation of Strategic Capabilities for Service Provision

Strategic capabilities and the relevant constructs were evaluated across the four archetypes of service provision, based on their ability to contribute to a sustained competitive advantage; these are classified as being of high, medium or low importance.

Strategic Capabilities that Represent High Importance

Only resources and capabilities that directly contribute to a sustained competitive advantage of a firm are regarded as highly important for the provision of services. These intangible and tangible resources are difficult to imitate by competitors, as they create value on their own and also through their exploitation.

Physical assets are the main source and therefore highly impact the competitive advantage for LSC firms. More so, it is the LSC firms' ability to properly exploit the logistics assets and equipment, which benefits their efficient operations of processes. For LSP (out) service provision, relational and organisational capabilities are the main drivers for maintaining superior performance and developing a sustained competitive advantage. In particular, organisational capabilities as they are a result of the highly hierarchical and sub-tier supplier governance structure, are most essential to this archetype. LSP (inst) firms also benefit by exploiting their organisational capabilities, through a close relationships with a single customer. For LSI service provision, know-how and the development and provision of superior industry knowledge are the main drivers for a sustained competitive advantage. This gathering of know-how and industry knowledge, amongst LSI firms, is strengthened via their established organisational structures as they constantly grow over time, through mergers or acquisitions.

Strategic Capabilities that Represent Medium Importance

Evaluating strategic capabilities based on their potential to contribute to a sustained competitive advantage also implies that some of these resources might not fulfil all the required criteria of scarcity⁴¹. This, however, does not preclude them from potentially contributing to a firm's competitiveness, but it may suggest that such an advantage may not be entirely sustained over time.

The archetype of LSC service provision emphasises, know-how, the development of knowledge and relational capabilities. However, the exploitation of these intangible resources does not necessarily lead to superior performance, insofar as these capabilities are both easily accessible and imitable by competitors in the market place. For LSP (out) services, the provision of privately owned physical assets is essential in developing strategic networks. However, given that these assets are basic and standardised, they are not, in and of themselves, particularly valuable. LSP (inst) firms also have their own physical resources, such as warehouse facilities and transportation units. Yet, similar to LSP (out) service provision, these physical assets are not innately valuable. In addition, LSP (inst) service provision is determined by advanced industry know-how, however,

⁴¹ Referring to Barney's (1991) VRIO assumptions of sustained competitive advantage, scarcity presumes the attributes of valuable, rare, inimitable and organisational.

this knowledge is not exclusive to the provider firm and also can be acquired externally by others. For LSI service provision, firms have their own assets in the form of distribution centres and, in some cases, transportation units. However, these physical assets only serve as the basis for the provision of services and therefore have a medium impact on their competitiveness. Relational capabilities are also present amongst LSI firms in the form of collaborations with LSI and LSP (out) firms and sub-tier providers, but ultimately are only partially important with regard to their contribution to LSI firms' competitiveness.

Strategic Capabilities that represent Low Importance

Referring to the theoretical assumptions of RBV (Barney, 1991) tangible and intangible resources that are not valuable, rare, inimitable or non-substitutable do not represent a source for competitive advantage. Consequently, these resources are considered to be of little strategic importance for the provision of services of a provider firm.

Amongst LSC firms, organisational capabilities were not identified as important. These firms lack an advanced hierarchical structure, and correspondingly, lack the relevant capabilities; thus, organisational capabilities are not explicitly important for the provision of LSC services. For LSP (out) service provision, little emphasis lies on the development of knowledge and know-how. Hence, the acquisition of industry expertise is expected and present amongst the LSP (out) firms in this thesis but these intangible resources do not impact their strategic competitiveness. For LSP (inst) firms, relational capabilities play a minor role, since most operations are conducted internally within their single customer's structures and therefore there is no need to expand on external collaborations. With regard to LSI service provision, all strategic capabilities actively contribute to a competitive advantage and thus, its strategic capabilities and resources are classified as either moderately or highly important.

5.1.2 Comparison of Strategic Capabilities across Service Provision

As a starting point for a later discussion on how the theoretical assumptions and constructs can be elaborated and expanded upon, this section compares the constructs as they pertain to strategic capabilities across the four archetypes of service provision.

Figure 5.1, as shown above, highlights the contradiction between the previously identified theoretical assumptions (in the literature) and the empirical findings (marked as bold)

empirical findings (marked as bold). This offers a starting point from which to base of the theoretical contribution of this thesis.

Comparing Organisational Capabilities across Service Provision

Organisational capabilities play a major role for most of the firms in the investigated sample. Primarily determined by a sub-tier supplier structure that is positioned upstream the supply chain, organisational capabilities for LSP (inst) and LSI firms are the most essential (i.e. highly impact) in maintaining a sustained competitive advantage. Developments in this area are primarily driven through the acquisition of new suppliers and partners, such as in the case of LSI firms; and by means of organic growth in both scope and scale, such as in the case of LSP (inst) firms. LSP (out) firms have also managed to develop such organisational capabilities over time. And, contrary to theory, which suggest that the basic and conventional services offered by LSP (out) firms do not lend themselves to advanced organisational capabilities, these firms have developed capabilities on a similarly high level to that of LSP (inst) and LSI firms. Lastly, given the dyadic and market-driven nature of their operations, LSC firms possess only few organisational capabilities, which was expected.

Comparing Relational Capabilities across Service Provision

Relational capabilities are moderately important for the archetype of LSC service provision. This was more or less expected based on the theoretical assumptions, which held that collaborations and the exploitation of relational capabilities play a minor role in the provision of standardised (dyadic) services, such as simple outsourcing operations and logistics activities. LSP (out) firms, alternatively, exploit these capabilities to the highest extent given their aim to increase the scope and scale of their operations. LSP (inst) firms cannot explicitly exploit relational capabilities because they are limited to their customer's boundaries and, therefore, have a relative low impact on the exploitation of strategic capabilities. LSI firms also place a relatively little emphasis on advancing these relational capabilities and they certainly do not exploit them in such a way that represents a source of competitive advantage.

Comparing Physical Assets and Resources across Service Provision

Physical assets are, as expected, of the highest importance for LSC firms, as this type of service provision solely relies on the exploitation and accessibility of tangible resources.

LSP (out) and LSP (inst) firms still exploit these tangible resources by either owning the physical assets, as in the cases for LSP (out) firms, or sharing them with their customer, as in the cases for LSP (inst) firms. Thus, exploiting assets is quite easy and therefore not a top priority but rather moderately important to these archetypes of service provision. The empirical analysis revealed that even for the highest level of service provision (i.e. amongst LSI firms) physical assets are still owned and exploited. Thus, contradicting to theory, which states that owning or requiring physical assets is not a requisite for the highest provision of solutions and systems. LSI firms exploit physical assets as a supplement to the provision of bundled services, while still retaining ownership.

Comparing Know-How and Knowledge Development across Service Provision

Know-how within the industry is moderately important for LSC and LSP (inst) service provision, but is not necessarily the main driver for competitive advantage. Due to their specialisation in a given industry, competitors show similar behaviour; thus, knowledge is developed over time and maintained through the frequent training and education of staff and employees. The highest level of service provision, as is represented by LSI firms, however, requires superior know-how of the industry, but more importantly it necessitates knowledge about the customers' and end-consumers' buying behaviour. Accordingly, emphasis is placed on developing a more customer-centric approach in terms of providing services or solutions that encourage sharing of information, such as sales data or stock replenishment in retail stores, and promote or expedite technological enhanced means of collaboration, such as IT platforms and knowledge databases. LSP (out) firms, especially when compared to LSC firms, do not markedly account for know-how and knowledge development. This, however, contradicts the theoretical assumptions of exploiting resources through close collaboration and partnerships. Similarly, LSP (inst) firms are undeveloped when it comes to cultivating and refining know-how and knowledge regarding their competitive advantage.

5.1.3 Impact of Strategic Capabilities on Service Provision

At this point, the relative impact of individual constructs, as they pertain to strategic capabilities, across the four different archetypes of service provision can now be discussed. The analysis found that the investigated firms in this sample do not always act as was originally anticipated by the theoretical assumptions. Figure 5.2 illustrates the refinement of the initial conceptual framework considering the empirical findings that

focus on the significance and impact of strategic capabilities across the four types of service provision.

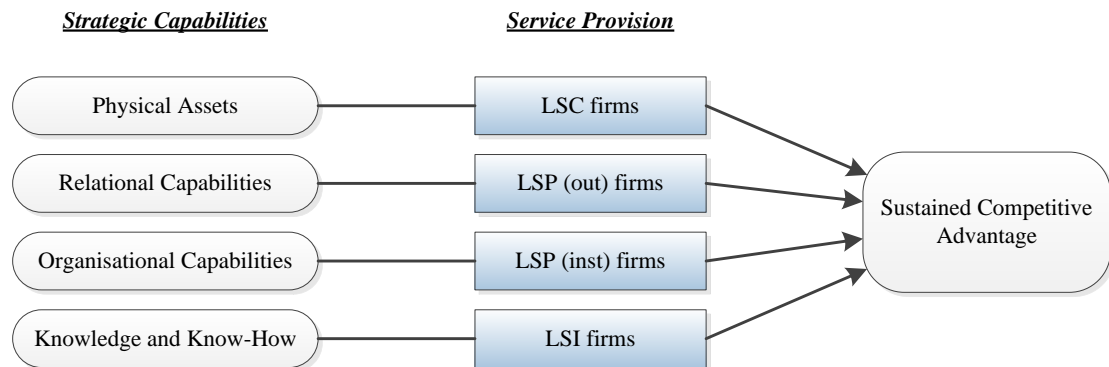


Figure 5.2: Comparison of Strategic Capabilities for Service Provision

The main findings related to the impact of strategic capabilities on service provision support the changing and overlapping behaviour of provider firms: (1) LSP (out) firms tend to employ organisational capabilities similar to LSI firms; (2) LSP (inst) firms employ their relational capabilities similar to LSC firms, and (3) LSI firms employ those (relational capabilities) similar to LSP (out) firms; and (4) LSP (out) firms tend to employ knowledge and know-how similar to LSC firms.

- (1) The conversion from LSP (out) firms towards the provision of LSI services, in the sense of developing relational capabilities, represents a trend that involves offering more sophisticated and customer-centric solutions within a single organisation. This trend has, thus far, yet to be identified and cannot be explained by the theoretical assumptions in the literature. This shift was supported in the empirical research by those LSP (out) firms that aimed to integrate not only their sub-tier suppliers, but also their customers and the end-consumers downstream the supply chain, into their organisational structure.
- (2) The conversion from LSP (inst) firms towards the provision of LSC services represents the scant emphasis placed on external parties. Even though LSP (inst) firms are meant to collaborate with external suppliers, the empirical data finds that most integration is done internally with their single customer. Such behaviour, although unexpected is replicated by LSC firms, which offer the provision of standardised and simple logistics services.
- (3) The shift from LSI firms towards the provision of LSP (out) services is supported by the lack of identifiable relational capabilities in the form of external collaborations.

Even though LSI firms supposedly represent the highest form of collaboration, the empirical data shows that their contractual relationships are primarily based on short-term contracts. Such behaviour is common across LSP (out) firms.

- (4) The shift from LSP (out) firms towards the provision of LSC services is based on the fact that sub-tier suppliers (i.e. carriers) are acquiring more knowledge and industry know-how than the LSP (out) firms, for that matter, which they use as a source for competitive advantage. Thus, even though the integration capabilities of LSP (out) firms are assumed rather high, the trend of expanding operations in terms of both scale and scope hinders and limits the development of proper know-how.

5.2 The Role of Governance Mechanisms across Service Provision

Based on the within-case analysis (see chapter four), Figure 5.3, as shown below, illustrates the findings related to governance mechanisms across the four archetypes of service provision and illustrates the relative impact of determinants on the underlying governance structures. The evaluation these factors are based on their relative impact on the governance structures for each of the four archetypes of service provision.

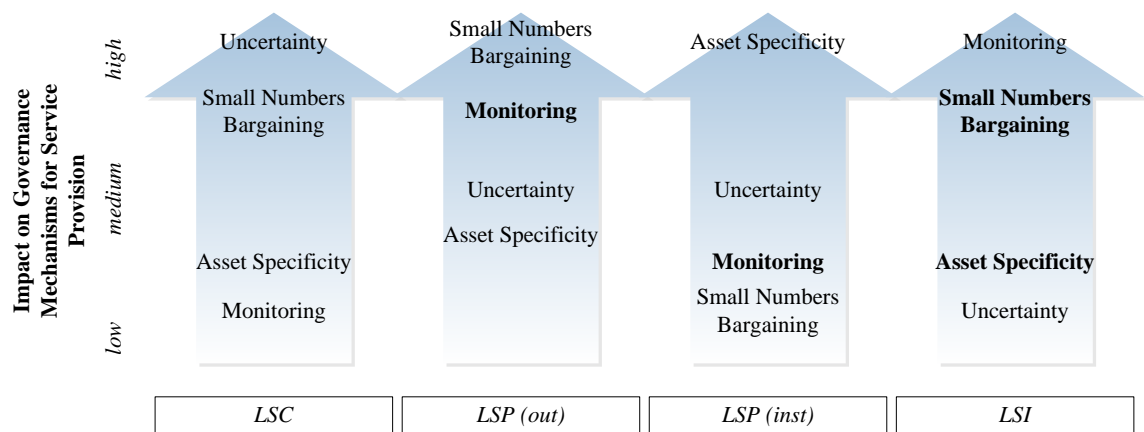


Figure 5.3: Evaluation of Governance Mechanisms across Service Provision

According to the theory of transaction cost economics, the main drivers for governance decisions are uncertainty, frequency and asset specificity. However, the empirical data suggests that monitoring costs and small numbers bargaining are also relevant, as they occur frequently within the investigated case firms in this thesis.

5.2.1 Evaluation of Governance Mechanisms for Service Provision

Referring to TCE, firms organise transactions following one of the two diametric forms of governance, that is, market or hierarchy based. A hybrid form is also possible, which involves incorporating strategies of both governance forms with regard to ownership of assets and control of transactions. Accordingly, an evaluation of the determinants on different governance structures was undertaken. The relative impact of each determinant is based on the extent to what each determinant contributes to impacting governance mechanisms; these are classified as having high, medium or low impact and are considered across each of the four archetypes.

Drivers that have a High Impact on Governance Structure

The high impact determinants are those, which have the greatest influence on the resulting governance structures for each of the four archetypes. Any form of governance, according to TCE, is determined by the following factors.

For LSC service provision, uncertainty and small numbers bargaining are the main drivers for a governance structure that most closely reflects a basic market dyad (i.e. arm's-length relationships). Uncertainty positively affects and allows the LSC firms to offer their services all-year round and given their standardisation, these services can be offered to a multiplicity of customers. Small numbers bargaining is important for this archetype considering the highly competitive environment associated with offerings such as basic services. Accordingly, a competitive pricing and bidding environment is common, both of which advocate a market governance form. In a similar vein, small numbers bargaining is also essential to the market-driven governance form of dyads evidenced in LSP (out) firms. Additionally, the monitoring efforts that are undertaken within this archetype of service provision, along with the associated costs of tracking and tracing products, for example, are also highly impactful. For LSP (inst) service provision, assets specificity mainly determines their hierarchical governance structure. LSP (inst) firms invest into specific assets, which increases their dependability on one single customer and, therefore, increases their financial risks, which further binds them to a hierarchical governance structure. The archetype of LSI service provision emphasises on monitoring costs and small numbers bargaining, which largely determine both their outsourcing and integrated relationships with customers or end-consumers and therefore highly impact a strong hierarchical structure.

Drivers that have a Medium Impact on Governance Structure

Those determinants that are considered moderately impactful on governance structures indicate a firm's hybrid status (i.e. implementing a combination of a market and hierarchical governance structure). It is worth noting that these factors do not always refer to the use of hybrid forms, but just indicate that there is not a clear distinction between market or hierarchy. In such instances, the control and ownership over a function or activity remains partly with the customer and partly with the provider firm.

For LSC service provision, such mid-range factors are not present at all, insofar as none of the identified cases in this sample implemented a hybrid governance forms. For this archetype, the constructs either relate to a purely market or purely hierarchical form. For LSP (out) service provision, uncertainty and asset specificity represent drivers that favour a hybrid governance form. This is evidenced when LSP (out) firms outsource warehouse space or transportation capacities in order to address seasonal variations in demand or for one-off projects or promotional services. In these instances, hybrid forms are present as uncertainty and project-specific assets inform them. Similarly, uncertainty has somewhat of an impact on LSP (inst) firms, given that they collaborate with external partners on rather rare occasions. If they do, also in order to overcome demand variations, they engage in hybrid forms. LSI firms, like LSC firms, do not show any indication of determinants that would result in a hybrid governance structure, as offered services represent either a purely hierarchical or a purely market structure.

Drivers that have Low Impact on Governance Structure

The determinants that minimally impact governance structures are those, which are relatively removed from actual transactions, but are still nonetheless present in daily business operations.

For LSC firms, neither asset specificity nor the costs of monitoring transactions drive the common form of market dyads in this archetype. In other words, investing in physical assets does not imply the high risks that are typically associated with the specificity of such assets (i.e. risks of negative returns on investment). For LSP (out) firms, all of the identified constructs had a moderate to high impact on their governance mechanisms, relative to the other archetypes of service provision. However, the least impactful determinant for this archetype was that of asset specificity for transactions, similar to that

of LSC firms. For LSP (inst) service provision, monitoring costs and small numbers bargaining are relatively unimportant and have less of an impact on the governance structure. This is due to the emphasis on internal relationships, which does not require such determinants, as the responsibility of organising transactions lies fully with the LSP (inst) firms. Hence, monitoring external partners becomes obsolete. Lastly, asset specificity and uncertainty of transactions are not essential in determining the governance structure amongst LSI firms. Related to uncertainty, LSI firms can overcome these conditions by delegating tasks to sub-tier suppliers, which also favours the utilisation of LSC firms, for example. However, the empirical data also did not evidence any implication of asset specificity on large-scale and highly integrated service providers. This is due to the fact that the LSI firms' strong organisational capabilities (i.e. hierarchy) can easily address the need for specific assets, and these provider firms also have the necessary financial capabilities to compensate rather high investments.

5.2.2 Comparison of Governance Mechanisms across Service Provision

As a starting point for a later discussion on how the theoretical assumptions regarding different forms of governance structures can be elaborated and expanded upon, this section compares the impact of different determinants on contractual or relational governance structures across the four archetypes of service provision. The above figure 5.3 illustrates the relevant empirical findings that contribute to TCE (marked in bold).

Comparing Uncertainty and Frequency across Service Provision

As was expected, uncertainty of transactions, with regard to operational activities in the form of standard activities, as well as short and/or long-term projects, impact governance structures differently. It is most impactful on standardised and basic logistics activities that represent high variations in demand, evidenced by LSC service provision. It has a moderate impact on hybrid governance structures as uncertainty of volumes and consumer behaviour can be addressed through further outsourcing, evidenced by LSP (out) and LSP (inst) service provision. Uncertainty has the lowest impact on hierarchical governance structures, represented by LSI service provision.

Comparing Small Numbers Bargaining across Service Provision

Given the competitive environment witnessed amongst LSC firms and LSP (out) firms, small numbers bargaining proves to be most impactful in determining their governance

structure. The findings also demonstrate that the less competitors there are, such as in the case for LSP (inst) service provision, the less important small numbers bargaining becomes for governing outsourcing relationships, which corroborates what we know from literature on TCE theory. However, contrary to this theoretical assumption, small numbers bargaining does significantly impact the governance structures in LSI service provision, insofar as these services are highly dependent on sub-tier suppliers and external partners, which necessitates external bidding. Hence, in this instance, the LSI archetype's hierarchical structure hinders the benefits that could be realised of small numbers bargaining. This was not expected from an initial review of the literature, but nonetheless refers to the uniqueness of LSI service provision.

Comparing Assets Specificity across Service Provision

The findings revealed that the relative impact of asset specificity on governance structures increases, when service offerings become more customised and complex, in terms of simultaneously integrating multiple processes and activities. This supports the applicability of TCE, which supposes that assets, for LSC service provision are of little specificity. LSP (out) services have a relatively higher specificity of assets than it is presented amongst LSC firms, in terms of more complex relationships and specified equipment. The highest form of asset specificity is evidenced in LSP (inst) service provision. Amongst those firms, asset specific investments result in the highest return on investments, compared to all other archetypes of service provision, further verifying the assumptions of TCE. Hence, investment decisions are carefully considered, insofar as the resulting profit depends on the specificity of the assets. Alternatively, and contrary to the assumptions of TCE, asset specificity serves as a very low driver for the underlying governance structures of LSI service provision.

Comparing Monitoring Costs across Service Provision

Similar to as asset specificity, the impact of monitoring costs increases with the complexity of processes and activities from market-driven towards more customised operations. For LSC service provision, monitoring costs represent the lowest driver for the governance structures, since this archetype engages in dyadic market relationships that do not impact further supply chain performance objectives that are driven by the customers or end-consumers. However, the impact of monitoring costs increases dramatically for LSP (out) service provision despite the fact that operations are not as

well integrated, as they are for say, LSI services. Nonetheless, monitoring the performance of sub-tier suppliers, for example, plays a major role in successful outsourcing relationships for LSP (out) firms. Monitoring costs for LSP (inst) service provision do not greatly impact contractual or relational governance, given that their customer is not aware or interested in supply chain wide logistics operations. This contradicts to the similarly low impact for LSC firms in the way that for LSP (inst) firms their customer drives such behaviour, and for LSC firms the high competition drives the behaviour. Finally, as was more or less expected, monitoring costs serve as a major determinant for LSI firms' governance structure, as they are frequently exploited via the constant and careful monitoring of sub-tier and sub-sub-tier suppliers.

5.2.3 Impact of Governance Mechanisms on Service Provision

Following the cross comparison that considered the relative impact of determinants as they pertain to governance structures, the subsequent conclusions can be drawn. The empirical data highlights the unexpected findings that deviate from and contradict what was initially anticipated by the theoretical assumptions. Figure 5.4 illustrates the refinement of the initial conceptual framework considering the empirical findings that focus on the impact of the drivers that determine the underlying governance structures across the four archetypes of service provision.

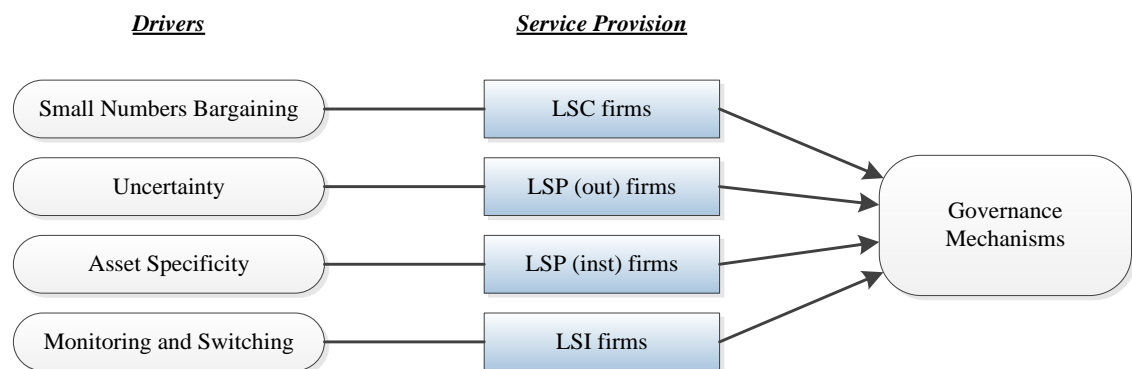


Figure 5.4: Comparison of Governance Mechanisms for Service Provision

The main findings related to the impact of factors on the governance structure support the changing and overlapping behaviour of the archetypes of service provision: (1) LSP (out) firms tend to highly consider monitoring costs similar to LSI firms and (2) LSP (inst) firms consider those (monitoring costs) less important, which is similar to LSC firms; (3) LSI firms consider small numbers bargaining as highly important, similar to LSP (out) firms; and (4) LSI firms consider the specificity of assets very little, similar to LSC firms.

- (1) The conversion from offering LSP (out) services towards the provision of LSI services occurs as a result of increasing monitoring practices and associated costs, which largely impacts the governance structures. This trend contradicts previous literature that refers to the LSP (out) firms' inability to measure performance outcomes. However, the empirical data in this thesis shows how LSP (out) firms manage a dynamic operations system that measures and subsequently improves the entire supply chain performance, including both downstream customers and upstream suppliers. Such a performance measurement system requires advanced technology and an advanced organisational structure in order to run effectively, which was expected primarily from LSI firms.
- (2) The shift from offering LSP (inst) services towards the provision of LSC services is represented by LSP (inst) firms' disinterest in monitoring efforts. Despite the fact that LSP (inst) firms provide rather integrated solutions, their customers neither require nor do they specifically ask them to meet performance objectives in terms of measurable outcomes. This occurs given their customer's limited knowledge of logistics and wider supply chain operations. Consequently, LSP (inst) firms behave like LSC firms by omitting monitoring practices from their service offerings.
- (3) The conversion from LSI firms towards the provision of LSP (out) services is evidenced by the increasing importance of small numbers bargaining. Contrary to previous research that has pegged LSI firms as monopoly giants operating in a market characterised by minimal competition, the LSI firms, in this sample, value and emphasise small numbers bargaining, in order to offer reduced prices to their customers. What this research found is that even for highly tailored and customer-centric solutions, price considerations associated with small numbers bargaining play a major role in determining the terms of a contractual governance structure.
- (4) The conversion from LSI firms towards the provision of LSC services is explained by asset specificity, which served as a main driver for governance mechanisms in this sample of LSI firms. Even though operations and processes might require highly specific assets and equipment, LSI firms generally do not consider these types of investments in deciding whether to govern logistics transactions internally (i.e. hierarchy) or externally (i.e. market). Previous research, particularly on 4PL providers, suggests that integrator firms do not consider assets in any capacity; however, this research finds that LSI firms are able to transfer asset specific investments (i.e. financial risks) to their upstream sub-tier providers and carriers.

5.3 The Role of Outsourcing Arrangements across Service Provision

Drawing on the previous within-case analysis in chapter four, Figure 5.5 illustrates the findings as they pertain to outsourcing arrangements across the different archetypes of service provision and describes the relative impact of the underlying constructs influencing the design of a contractual or relational governance arrangement. The evaluation is based on a relative comparison of how each construct affects the design of outsourcing arrangements for each type of service provision.

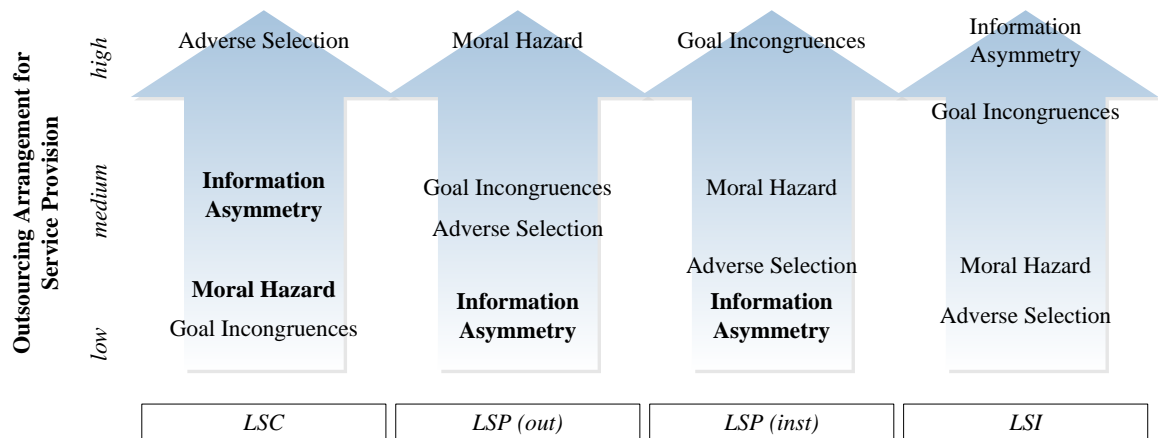


Figure 5.5: Evaluation of Outsourcing Arrangement across Service Provision

According to the general assumptions of agency theory, the design of a contractual relationship, characterised as either behaviour-based or outcome-based, is influenced by opportunism and the bounded rationality of managers. Within the context of this study and considering the investigated firms, the phenomenon of opportunistic behaviour, which can be reduced by designing the most effective outsourcing arrangement, is determined by the items of adverse selection, moral hazard, information asymmetry and goal incongruences, as discussed below.

5.3.1 Evaluation of Outsourcing Arrangements for Service Provision

In order to understand the nature of outsourcing arrangements and the criteria that drive these decisions, the relevant antecedents were identified in chapter two (literature review) and presented in the initial conceptual framework (see Figure 2.13). The relative impact with regard to how these constructs contribute to finding the most effective outsourcing arrangement amongst the sampled firms is classified as high, medium and low. Notably, the evaluation only considers the constructs based on their *impact* on outsourcing

arrangements; it does not consider the *result*, i.e. whether they engage in behaviour-based or outcome-based contracts.

Drivers that have High Impact on Outsourcing Arrangements

For each archetype of service provision, there are those crucial determinants that help determine whether outsourcing relationships favour an outcome-based or behaviour-based arrangement. Interestingly, none of the investigated cases in this sample represent a pure condition of contract design (i.e. pure behaviour-based or pure outcome-based). Thus, a mix between outcome and behaviour is the norm. Purposely, the empirical data does not explain the actual design and contractual details, but rather focuses on the underlying determinants, being either behaviour-based or outcome-based.

Amongst LSC service provision, adverse selection is the single most important factor in any collaborative relationship. Given their adherence to short-term relations (i.e. ‘arm’s-length’), LSC firms emphasise the *ex-ante* selection of carriers (i.e. adverse selection). Hence, outcome-based contracts are more common. Notably, however, they still engage in behaviour-based arrangements, such as in the provision of warehousing contracts, for example, where LSC firms advance their standardised activities. For LSP (out) service provision, moral hazard represents the most essential determinant in defining outsourcing arrangements, particularly with regard to performance measures related to transportation and warehousing efficiency. Likewise, LSP (inst) firms engage with performance objectives post-contract. Thus, it is the customers who value their ability to monitor and track their service provision performance. For LSI service provision, as was expected, goal incongruences and information asymmetry have the greatest impact on the underlying contractual relationship with both customers and sub-tier suppliers. Insofar as LSI firms tend towards a more customer-centric approach, end-consumer interaction ultimately drives the *ex-ante* and *ex-post* design and hence, the selection criteria for sub-tier service provision. Ergo, LSI firms engage in rather behaviour-based contracts with downstream customers (i.e. reduce goal incongruences) and outcome-based contracts with upstream sub-tier providers (i.e. reduce information asymmetry).

Drivers that have Moderate Impact on Outsourcing Arrangements

Amongst the investigated case firms, the following drivers have a mid-level impact on contractual or relational outsourcing arrangements. Such determinants are common and

while the case firms aim to address them, typically in a strategic sense, not enough emphasis is placed on incorporating these factors in an operational or tactical level. This applies primarily to the archetypes of LSC, LSP (out) and LSP (inst) service provision, where the firms are aware of the underlying factors, but do not have the resources or abilities to amend their relational or contractual arrangements, accordingly.

For LSC service provision, information asymmetry is a driver for establishing the appropriate outsourcing arrangements. However, the customers as opposed to the LSC firm itself primarily drive issues of data and information transparency. Thus, as was expected, minimal efforts pertaining to information asymmetry were made, with the exception of some firms that attempted to relate specific outcomes to the contract design. For LSP (out) service provision, goal incongruences and adverse selection qualify as moderately important and contribute to the design of contractual relationships to some extent, insofar as these provider firms carefully select proper sub-tier carriers in an outcome-based manner. However, as was expected, these drivers are merely considered rather than actually incorporated by either the customers or the LSP (out) firms. In addition, amongst the investigated LSP (out) firms, goal incongruences between the providers and the buyers (i.e. customers) are both evidenced and widely accepted. Yet, most attempts to mediate the situation (i.e. realign the misaligned goals) are undertaken *after* the relationship has already been established. In terms of adverse selection, LSP (inst) firms experience a similar situation to LSP (out) firms, where moral hazard is addressed post-contract and does not, therefore, influence any performance measures or objectives.

Drivers that Represent Low Impact for Outsourcing Arrangements

Referring to the theoretical assumption of agency theory, any relational or contractual governance form should aim to reduce the risk of opportunistic behaviour. However, determinants for such opportunistic behaviour, as operations management research understands it, might still be present in any relationship, even if these determinants do not explicitly affect the resulting arrangement.

Such low-level drivers for LSC firms are goal incongruences and moral hazard. In the investigated sample of case firms, LSC service provision generally represents a relational arrangement that entails very little alignment of common goals between providers and customers. These goal incongruences, which were more or less expected, are based on a

rather relational arrangement and do not affect the underlying contract, i.e. outcome-based contracts are widely accepted and commonly employed. What is surprising, however, is that the risks associated with moral hazard, which were expected to have a relatively high impact on firms, particularly on low-level LSC services, is not explicitly evidenced amongst the sample firms. Even though customers usually claim that their providers' performance is not sufficiently aligned with their expected requirements, there was no evidence of any attempt from either party to address this issue. For LSP (out) service provision, information asymmetry is the least decisive factor in determining outsourcing arrangements. Given their emphasis on dyadic market relations, there is no need to increase information transparency to the upstream sub-tier suppliers. However, the issue of transparency becomes more important when considering the downstream customer, as is the case with LSP (out) firms 6, 7 and 25, who aim to strengthen their ties with downstream customers. For LSP (inst) service provision, information asymmetry also plays a minor role, given that the provider usually has easy access to all relevant and necessary information. This in turn, reduces any risks associated with information asymmetry, such as high negotiation or monitoring costs. Finally, as is the case with LSI firms, as was expected, moral hazard and adverse selection have the least impact on outsourcing arrangements. This is due to the nature of their strategic and long-term relationships, which do not require overcoming sub-tier contractual risks associated with moral hazard and adverse selection, such as monitoring sub-tier providers' performance and switching those, respectively.

5.3.2 Comparison of Outsourcing Arrangements across Service Provision

Prior to elaborating on the theoretical contributions with regard to the design and selection of the outsourcing arrangement (i.e. outcome-based or behaviour-based), this section compares the relative impact of the identified determinants. Figure 5.5 illustrates the theoretical contributions (marked as bold) and highlights the contradictions between theoretical assumptions and the empirical findings.

Comparing Adverse Selection across Service Provision

Adverse selection, as it pertains to risks associated with firms selecting inadequate providers or external contractors (i.e. sub-tier suppliers), is very relevant in LSC service provision. Given the wide variety and range of LSC firms in the marketplace, manufacturers and producers (i.e. customers) lack sufficient information and knowledge

required to choose a suitable supplier firms or carrier for their needs. Thus, as a result of such uncalculated decisions, LSC outsourcing relationships are typically short-term and outcome-based. As was expected, the impact of adverse selection on the outsourcing arrangement is reduced as contracts become less outcome-based and more behaviour-based. LSP (out) and LSP (inst) firms also experience risks associated with adverse selection; however, these risks are more manageable because LSP (out) and LSP (inst) firms pursue much closer relationships with their upstream suppliers and downstream customers. Hence, these archetypes of service provision communicate their service offerings more accurately. While adverse selection for LSP (inst) firms is present, the associated risks are almost completely negligible, as LSP (inst) firms, in most cases, are highly integrated with their customer's organisational structure. Lastly, adverse selection is not at all an issue amongst LSI service provision, as the contractual relationships are more strategic and behaviour-based. That being said, certain upstream relationships that are not contractual in their nature might follow a more outcome-based approach, which however do not consider issues related to adverse selection because LSI firms have access to relevant data due to their integration capabilities.

Comparing Information Asymmetry across Service Provision

Across the four archetypes of service provision, information asymmetry was expected to be highly important with regard to defining contractual arrangements both *ex-ante* and *ex-post*. For LSC service provision, however, information asymmetry only plays a moderate role in determining the outsourcing arrangement with their downstream customers (i.e. mostly service provider). Thus, even though these standardised services require minimal interaction with customers and other supply chain partners, customers actively use and strive for information about the LSC firms and their performance. Notably, information asymmetry is not a major driver for outsourcing arrangements amongst the archetypes of LSP (out) and LSP (inst) service provision, whatsoever. LSP (out) firms manage their services based on an industry standard that increases the customers' ease of access to relevant information, such as tracking and tracing of products and deliveries; therefore risks associated with bounded rationality, such as the inability to holistically oversee network-wide transportation, are mitigated and not considered by customers. A similar situation applies to LSP (inst) firms, where customers and service firms rely on the same data set and pool of information. Information asymmetry has the highest relative impact on the outsourcing arrangements for LSI service provision. In

particular, post-contractual transfer of information and data, including shipment data, customer satisfaction and end-consumer interaction, are of high priority, customer requirements notwithstanding.

Comparing Moral Hazard across Service Provision

Based on the general theoretical assumptions of AT, the risks associated with moral hazard, i.e. increasing monitoring and switching costs, were presumed to be dealt with in a similar way to those associated with adverse selection. For LSC service provision, however, moral hazard only plays a minor role. Customers seemingly instil more confidence (and trust) in LSC firms' operations than was anticipated, with regard to their low-level integration and standardisation of products that suggests customers of LSC firms do not have the sufficient knowledge needed to measure the providers' performance. As a result, this trust largely mitigates the risks and associated costs of monitoring and controlling *ex-post* activities. Moral hazard has the greatest impact on LSP (out) service provision, as was more or less expected; this results (and also explains) in a constant and active engagement with sub-tier suppliers. LSP (out) firms, given that they compete on a more customer-centric level with each other, aim to reduce their customers' financial risks, associated with moral hazard. Thus, the investigated firms in this sample share all relevant information and data with their customers as soon as it becomes available. LSP (inst) and LSI firms both characterise moral hazard related risks as being moderately (medium) to not important (low), respectively.

Comparing Goal Incongruences across Service Provision

It was expected that the importance of goal incongruences would increase from basic services (i.e. LSC and LSP (out) firms) to highly integrated services (i.e. LSP (inst) and LSI firms) to become a primary driver for outsourcing arrangements, similar to the determinant of information asymmetry. For LSC firms, even though information asymmetry was moderately important, goal incongruences are considered even less. This is because LSC firms are widely known for their opportunism, which results in a very low-level integration of their services. LSP (out) firms, on the other hand, focus more on aligning goals with their customers. However, such alignment of goals is only considered abstractly, rather than actually executed in practice. Alternatively, goal incongruences represent a primary driver with a significantly large impact on *ex-post* contract design amongst LSP (inst) firms, insofar as they hold their customer liable for their performance

development. Even though LSP (inst) firms closely align their operations to their customer's requirements, aligning strategic goals suffers from opportunistic behaviour on both the customer and provider side. Due to the limited scope of offered services, LSP (inst) firms compete with LSP (out) firms, with the exception that LSP (inst) provision depends on a single customer only. Therefore, the risks of opportunistic behaviour resulting from their buying power need to be addressed accordingly in *ex-post* contracts. For LSI service provision, goal incongruences are primary determinants that affect whether a contract design is outcome-based or behaviour-based. This is similar to that of LSP (inst) service provision.

5.3.3 Impact of Outsourcing Arrangements on Service Provision

Drawing on the cross comparison of the drivers for outsourcing arrangements across the different archetypes of service provision, the following statements are put forth. The findings highlight the unexpected or contradictory results that depart from the theoretical assumptions of AT and explain the behaviour of certain archetypes of service provision. Figure 5.6 illustrates the refinement of the initial conceptual framework considering the empirical findings that focus on the impact of determinants for outsourcing arrangements across the four archetypes of service provision.

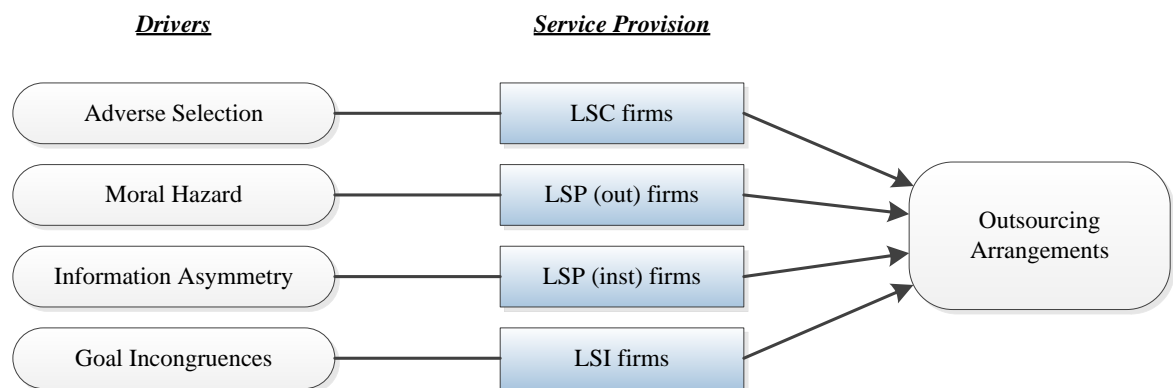


Figure 5.6: Comparison of Outsourcing Arrangements for Service Provision

The main findings from the cross comparison related to the impact of determinants on outsourcing arrangements support the changing and overlapping behaviour of the archetypes of service provision: (1) LSC firms tend compensate risks associated with moral hazard similar to LSP (out) firms; (2) LSC firms consider information asymmetry similar to LSP (out) firms, also (3) both LSP (out) and LSP (inst) firms employ actions

related to information asymmetry similar to those representative for LSC firms; and (4) LSP (inst) firms foster the barriers of goal incongruences similar as LSI firms do.

- (1) The shift from LSC service provision to offering LSP (out) services is demonstrated by the relatively low consideration given to moral hazard amongst the case firms in this sample. The fact that customers place such little emphasis on acquiring information about LSC firms' performance contradicts the assumptions that very basic transactions and operations are governed via an outcome-based relationship. Moreover, the downstream providers (i.e. LSP (out) firms) prepare the data about the LSC firms' performance for the final customers instead. Furthermore, customers do not show any initiative to increase or develop their knowledge about the logistics carrier (LSC) market, rendering them unable to evaluate their carriers' performance. From the providers' perspective, however, such customer behaviour is typical for LSP (out) services, where the service firms clearly specify their service offerings and outcome objectives, which is where LSC firms convert.
- (2) The conversion from offering LSC services towards the provision of LSP (out) services is evidenced by the increased importance of information asymmetry amongst LSC firms. Methods and techniques of information sharing amongst LSC services, such as through tracking and tracing technology, as well as through the provision of online status updates, finds application in the most basic transactions and logistics activities.
- (3) LSP (out) and LSP (inst) firms, on the other hand, pay relatively little attention to the issue of information asymmetry, which represents their conversion towards more basic LSC services. For LSP (out) firms, such a shift is a result of the confidence bestowed on them by their customers. The investigated case firms in this sample gained their customers' full trust in conducting all relevant and (mostly) integrated logistics operations, despite the fact that not all information can be shared continuously. Likewise, for LSP (inst) service provision, information asymmetry as a non-issue also relates to the high trust they engender from their customers, which is associated with the performance outcomes.
- (4) The shift from LSP (inst) services towards the provision of LSI services is grounded in the relatively high impact of goal incongruences on LSP (inst) firms. This was commonly expected from firms offering highly integrated solutions, namely LSI firms, but is also present in LSP (inst) services. In order to align goals and desired outcomes, LSP (inst) firms usually implement highly specific contractual designs

that clearly specify performance outcomes because they mostly operate in niche markets and exploit specific equipment.

5.4 The Role of Systems Integration Capabilities across Service Provision

Following the within-case analysis (presented in chapter four), Figure 5.7, as shown below, illustrates the findings as they relate to systems integration capabilities across the different archetypes of service provision and describes the relative importance of constructs, which represent such integration capabilities. The evaluation of these factors are based on their relative importance in terms of the extent to which the individual constructs are employed and exploited across each archetype of service provision.

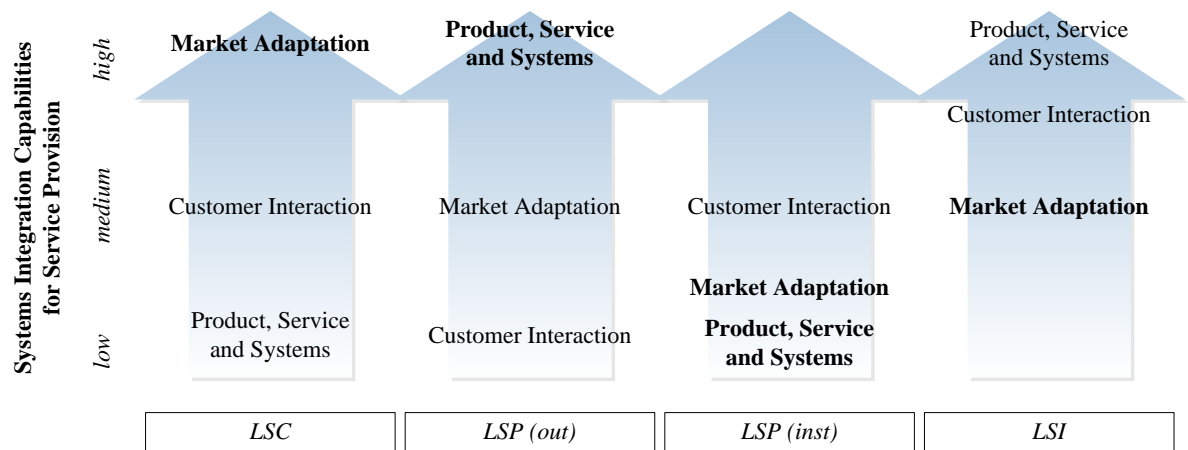


Figure 5.7: Evaluation of Systems Integration capabilities across Service Provision

According to the research in the field of operations management about servitisation and the discussions that go beyond simple insourcing and outsourcing decisions, the main determinants for systems integration capabilities are the provision of products, service and systems (PSS), the degree of downstream and upstream interactions and the ability to quickly react to changing customer requirements.

5.4.1 Evaluation of Systems Integration Capabilities for Service Provision

In order to understand the nature of systems integration capabilities, along with the factors that determine whether a firm is able to effectively execute the relevant operations and offer service solutions, an evaluation and comparison across different archetypes of service provision is presented in this section. The relative importance is determined based on how systems integration capabilities are employed across the service archetypes in this thesis and are therefore classified as low, medium and high. The determinants of how

systems integration capabilities relate to different archetypes of service provision is evaluated based on a relative comparison, focusing on the provider firms' product offerings and their willingness to interact and adapt to changing markets and end-consumer requirements.

Systems Integration Capabilities that represent High Importance

Systems integration capabilities that are classified as being highly important represent those constructs that are initiated by the provider firms themselves and reflect their ability and willingness to contribute to the phenomenon of servitisation. Notably, while not all provider firms strive to provide full service solutions, some components akin to systems integration capabilities are evidenced.

Amongst LSC service provision, the investigated firms in this sample are able to adapt to market changes exceptionally quickly. The provision of LSC services, as was previously outlined, requires only the most basic equipment and assets, resulting in relatively short and uncomplicated (i.e. less integrated nature and low complexity of activities) process structures and simple operations that can easily be adjusted. Consequently, their ability to adapt to changing customer requirements is relatively high and important, insofar as these changing requirements are limited to, for example, changing delivery times, locations or changing volumes. Notably, these are not strategic changes, which limits the LSC firms' systems integration capabilities to an extent. For LSP (out) service provision, advanced PSS is both highly important and frequently executed based on individual customer requirements, which comes as a surprise, given that the degree of end-consumer integration in this archetype is relatively low. However, LSP (out) firms typically offer multiple services to few customers simultaneously with the intention of strengthening the customer-provider relationship. Additional services, in the form of optional bundles (i.e. a full range of services combined, such as distribution, replenishment and warehousing activities) can be added-on to the customers' existing contracts. Amongst LSI service provision, advanced PSS also has the highest impact with regard to strengthening their integration capabilities. The LSI firms, in this sample, offer an extensive range of products and services that customers can choose from, which ultimately contributes to the provision of integrated services within an entire supply chain or supply network. In addition, interaction with end-consumers serves as one of the main drivers of innovation and contributes to the servitisation capabilities.

Systems Integration Capabilities that Represent Medium Importance

The constructs that are moderately important to systems integration capabilities include determinants that go beyond that of a standard outsourcing dyad, but do not fully incorporate the idea of servitisation or the provision of systems-wide service solutions.

LSC firms are aware of the importance of interacting with customers and suppliers; however, their ability to continuously share information and communicate on a regular basis is limited, due to the lack of IT structures and human resources. However, the investigated LSC firms in this sample do make some attempts to deliver and provide basic status reports via conventional means of communication, such as email and telephone. For LSP (out) service provision, the ability to adapt to a dynamic market and changing customer requirements are moderately important with regard to their ability to providing integrated systems offerings. However, it is the customers, who drive their adaptation and initiate changing service offerings, rather than the provider firms themselves. Thus, given their lack of initiative, the archetype of LSP (out) service provision fails to consistently keep up with the ongoing market changes. For LSP (inst) firms foster very close relationships with their primary customer. However, the interaction with end-consumers remains within the responsibilities of the customer itself. Therefore, while interaction in this archetype is evidenced to a certain extent (i.e. limited to one customer only), it is not fully exploited to a degree that greatly advances their systems integration capabilities. For LSI service provision, the ability to adapt to market changes is only moderately important. As a result of their organisational and hierarchical structure, LSI firms experience difficulties with reacting quickly to changing market conditions and particularly changing customer requirements. Thus, while they are quick to *identify* changing customer (and also end-consumer) requirements, their adaptation (i.e. the *execution*) to these changes is a long-lasting process, given their reliance on sub-tier and sub-sub-tier provider firms or carriers.

Systems Integration Capabilities that Represent Low Importance

Those determinants that have little impact on systems integration capabilities for each archetypes of service provision are, based on the servitisation literature, underestimated with regard to their value-adding potential.

For LSC firms, the provision of advanced PSS finds no evidence amongst the investigated firms in this sample. As was described in the within-case analysis (see chapter four), service offerings only include standardised and basic transportation and warehousing activities. Further, the interview respondents demonstrated no intention to extend their service offerings towards a more supply chain wide or systems-oriented product portfolio. Amongst LSP (out) firms, the interaction with both downstream end-consumers and upstream suppliers lacks sophistication. LSP (out) firms pay little attention to what end-consumers want and focus more on satisfying their direct customers' needs. Consequently, it is the customers alone, who serve as the link between the service providers and end-consumers. Amongst LSP (inst) firms, market adaptation and the ability to provide enhanced PSS are both uncommon and have minimal impact on their overall systems integration capabilities. As was expected, LSI firms continuously adjust and amend their service offerings towards the provision of superior service solutions, focusing on all systems integration determinants, thus none of the identified constructs are considered unimportant for LSI firms.

5.4.2 Comparison of Outsourcing Arrangements across Service Provision

To preface the discussion about how systems integration capabilities across the four archetypes of service provision contribute to the understanding of service provision and service boundaries, this section compares the relative impact of the identified factors for each archetype. The above introduced Figure 5.7 illustrates how the empirical findings contradict the theoretical assumptions (marked as bold) that were derived from the review of the literature and presented in the initial orienting conceptual framework.

Comparing the Ability of Market Adaptation across Service Provision

Within the boundaries of a supply network, the ability for provider firms to react quickly to market changes, with regard to operational flexibility and strategic adaptation to changing customer and end-consumer behaviour, differs across each of the four archetypes. Of the four archetypes, LSC firms are the most adaptable, which was not expected, considering the low-level supply chain integration and systems-wide involvement. However, compared to the other archetypes, LSC firms benefit from such little integration roles, as they are able to quickly modify their strategies and operations, thus converting innovation into practice faster than any other hierarchically structured organisation, for example. Alternatively, yet expectedly, these adaptation capabilities are

only moderately important for LSP (out) firms, as their services typically oscillate between downstream customers and upstream supplies, which does not allow them to properly expand on their market adaptation capabilities. For LSP (inst) firms, adaptation is considerably low, given that, like for LSP (out) service provision, these services are more complicated in the form of a larger scope of operations. Furthermore, the LSP (inst) firms' customers suppress the provider's ability to innovate and anticipate future demand and end-consumer behaviour. Finally, market adaptation is rather important for LSI service provision, however, only to a moderate extent, which contradicts previous assumptions in the literature that purports the highest form of service integration should continuously adapt their services to meet end-consumer requirements.

Comparing the Ability of Customer Interaction across Service Provision

As was anticipated, the importance of interaction capabilities generally increases from standardised LSC services to highly integrated relationships represented by LSP (out) and LSP (inst) firms, to the provision of LSI service solutions.

Interaction capabilities are moderately important for LSC firms, who make considerable efforts to interact, particularly with upstream suppliers. This rather upstream interaction stems from their extensive knowledge of manufacturers' (i.e. material suppliers) operating procedures, such as loading and unloading procedures, time window constraints and opening hours. LSP (out) firms consider the interaction with sub-tier suppliers to be relatively unimportant and also do not actively interact with downstream customers; this is likely a result of their intermediate distribution operations that are somewhat standardised but still more advanced than those of LSC firms. Similarly, LSP (inst) firms, even though they primarily interact with a single customer, they do not interact with end-consumers. Only LSI firms engage with end-consumers, by integrating their service to meet both the customers' specifications (i.e. downstream integration). In this way, their ability to communicate and share data, particularly with end-consumers, is highly important, rendering interaction capabilities a top-priority for this archetype of service provision, with regard to their systems integration capabilities.

Comparing the Development of Products, Service and Systems across Service Provision

The development of enhanced services (i.e. PSS) suggests a shift from offering simple products towards the provision of services and ultimately customer-centric service

solutions. Previous literature would suggest that the importance of PSS is relatively low for basic LSC services, moderate for LSP (out) and LSP (inst) services and very high for LSI services.

Accordingly, the investigated LSC firms in this thesis are unable to pursue the development of PSS, given that the provision of such advanced services requires extremely high developed and specialised resources, most of which are intangible, such as organisational capabilities and expertise of human capital. Indeed, the majority of contracts in this archetype of service provision imply simple market transactions that include one particular process of either transportation or warehousing. LSP (out) firms, however, offer a relatively wide range of combined products and services to their customers. By combining warehousing and distribution processes, along with designing and developing network strategies, LSP (out) firms maintain a high standard of service provision. Contrary to the theoretical assumptions of highly integrated services, LSP (inst) firms do not pursue any additional service integration or product development strategies for their customer. Due to the strict monitoring requirements placed on them by their customer, their focus is solely on delivering customer goods, efficiently and effectively. In addition, these monitoring efforts are not executed strictly but are expected to be incorporated within the LSP (inst) firms' internal operations. Understandably, there is no room for innovation and no need to develop or offer PSS to their customer. For LSI service provision, the development of PSS is their top priority in terms of advancing their systems integration capabilities. LSI firms in this sample emphasise customer retention and customer loyalty (more so than any other archetype insofar only few customers require such specialised treatment). In this way, LSI firms go beyond providing requested services to offer additional services, such as financing, consulting and monitoring technologies.

5.4.3 Impact of Systems Integration Capabilities on Service Provision

Following the cross comparison that looked at the determinants of systems integration capabilities across the four archetypes of service provision, the following conclusions can be summarised. The empirical analysis highlights the unexpected findings, which contradict the anticipated assumptions about PSS, customer interaction and market adaptation capabilities. Figure 5.8 illustrates the refinement of the initial conceptual framework considering the empirical findings that focus on the important components

that underline systems integration capabilities across the four archetypes of service provision.

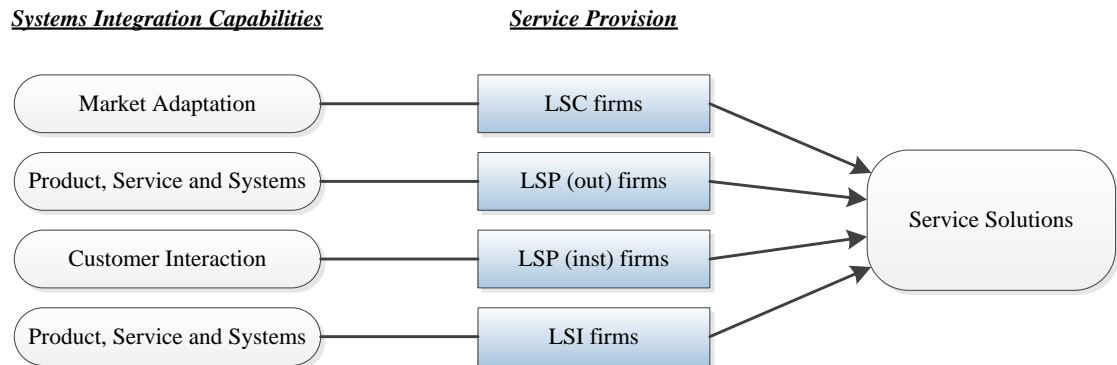


Figure 5.8: Comparison of Systems Integration capabilities for Service Provision

The main findings from the cross comparison related to the impact of determinants on systems integration capabilities support the changing and overlapping behaviour of the service provision archetypes: (1) LSC firms use their ability to adapt to market changes similar to LSI firms and (2) LSI firms use those similar to LSP (out) firms; (3) LSP (out) firms develop PSS similar to what was expected from LSI firms, and (4) LSP (inst) firms employ these PSS similar as LSC firms do.

- (1) The conversion from LSC service provision to offering LSI services appears, at first glance, quite ambitious. However, LSC firms are highly adaptable and able to respond quickly to changing customer demand, given their flexibility towards changing orders, delivery points, pick-up locations and/or accessing additional equipment (short-term). Therefore, LSC firms, more so than any other archetype of service provision, are able to improve operational effectiveness and efficiency in almost real time. While such behaviour is typically expected from integrator firms, due to the sub-tier hierarchy in LSI service provision, the operational structures are too long and complex to allow for quick transformation or adaptations.
- (2) The shift from LSI services to the provision of LSP (out) services also relates to the issue of market adaptation. This shift is evidenced given the inability of LSI firms to timely and adequately address changes in demand and/or supply. Their long and complex hierarchical supply chain structures only allow for strategic, mostly *ex-ante*, changes. Nonetheless, their ability to impact the entire supply chain is given but on a much larger time scale, insofar as the implementation and execution of changes requires long times.

- (3) Regarding the development of product, service, and systems, LSP (out) firms are moving towards providing LSI services. Notably, they are only offering these services to priority customers (i.e. large-scale retailers). Due to their advanced and sophisticated distribution networks including multiple owned facilities, LSP (out) firms can easily extend their range of services. Even though LSP (out) firms are largely asset-based and mainly focus on achieving operational excellence, the case firms in this sample engage in the development of market and product development strategies within their organisations, to the benefit of their customers.
- (4) In contrast to LSP (out) firms, LSP (inst) firms do not have the capabilities or resources to extend their current service offerings. The conversion towards providing LSC services is evidenced in the strict relationships with their single customers, which restrict innovation and exclude synergies that could be realised across their customer's supply chain.

5.5 Summary of Comparison across Four Archetypes of Service Provision

This chapter has presented the findings from the cross comparison of the theoretical constructs from the initial conceptual framework, across the four proposed archetypes of services provision. Such a comparison addresses research question four regarding how the boundaries of different archetypes of service provision can be described. Thus, the answer to this question, as is discussed in the next chapter, is to develop a service provision continuum. Drawing on the empirical findings from the multiple case study, explicated in both this chapter and chapter four, the following chapter six discusses the theoretical, methodological and practical contributions of this thesis.

CHAPTER SIX:

DISCUSSION OF THE FINDINGS

The purpose of this chapter is to reconcile the descriptive case study findings and the cross-case comparisons, by referring back to the literature and presenting a contextualised framework. This chapter, consequently, highlights the theoretical, methodological and managerial contributions and implications of this thesis and ties together the key arguments from the previous chapters. In particular, and following the title of this thesis, this chapter aims to advance the service providers' perspectives on systems integration by re-defining the service boundaries towards the development of a service provision continuum within the context of logistics. This includes two angles: First, as was supported in the within-case analysis, there is evidence for four archetypes of service provision and each of those archetypes has its own dynamics, in the form of the provider firms' developed capabilities. Second, as was supported in the cross comparison of the archetypes, there is evidence for a service provision continuum that challenges distinct service boundaries for the archetypes and proposes that provider firms' tend to behave differently according to their relationship with the role of systems integrators. This chapter responds to the initial research questions (Table 1.1) in section 6.1 and contributes to the discussion in section 6.2, by going beyond a conventional insourcing and outsourcing debate by contextualising the initial conceptual framework. This chapter concludes with a reflection on the theoretical, methodological and managerial contributions of this thesis, addressed in section 6.4.

6.1 Response to the Research Questions

Four research questions guided the data collection and case study processes in this thesis. The following sub-sections respond to these research questions by discussing the findings of the theoretical and empirical analysis in light of the initial conceptual framework. Research questions one and two were addressed using secondary data in the form of extant literature and archived documents. Research questions three and four were addressed using primary data in the form of interviews and observations as part of the

case study design, which were analysed using within-case analysis and cross comparison, respectively.

6.1.1 Response to Research Question One

Following calls for more empirical work and rigour in logistics and supply chain management research (Stock 1997, Spina et al. 2013), the first research question addresses the development of logistics outsourcing over time.

Research Question One: *What has been the focus, nature, salience and influence of research in logistics outsourcing and how has it changed over time?*

In responding to this first research question, this thesis identified a trend in logistics outsourcing research towards more empirical and qualitative work being done in the field of operations management and proposes an alternative perspective to the standard presentation of the focal firm and customers, to that of the service providers.

A Changing Focus of Logistics Outsourcing towards the Providers' Perspective

Historically, academic research has pragmatically addressed service provision and the phenomenon of systems integration by following the specific practices implemented by a *focal firm*, i.e. based on a focal firm's outsourcing decision and the strategic dimensions of gaining and sustaining a competitive advantage within complex industries (Roehrich and Lewis 2010, Spring and Araujo 2014). These studies have often identified service functions as the ones most likely to be outsourced to third parties, resulting in any collaborative (buyer-supplier) form of contractual or relational arrangement (Skjoett-Larsen 2000, Bolumole 2003, Holcomb and Hitt 2007, McIvor 2009). Accordingly, scholars have investigated the benefits and pitfalls of the service, and of particular interest here the logistics function, and frequently cite cost and time saving factors that support the strategic decision of outsourcing. While service outsourcing mostly benefits the focal firm (Tsai et al. 2012), an industry has developed due to the emergence of *providers* for these services or suppliers that provide logistics and supply chain capabilities. During the 1980s and 1990s the market for third party logistics (3PL) providers boomed, while academia fostered a growing interest in the development of firms' core competencies (Peters and Waterman 2012) and supply chain management (Halldorsson et al. 2007). With every passing decade, supply chain issues are viewed as strategic in nature, which

consequently prompted research on 3PL providers as the central unit of analysis (Markus Berglund et al. 1999, Bolumole et al. 2007, Selviaridis and Spring 2007, Marasco 2008).

In sum, logistics outsourcing literature already distinguishes between the focal firm (i.e. buyers), the providers (i.e. suppliers) and the customers (i.e. end-consumers) of services. However, as this research shows, the providers' perspective is most crucial in defining and evaluating the service provision boundaries and needs more attention.

The Nature of Logistics Outsourcing Knowledge

Any academic field is constitutive of and constituted by the type of research being conducted. In examining extant literature, the SLR conducted in this thesis follows Locket et al.'s (2006) distinction between empirical and theoretical research and categorises the nature of logistics outsourcing studies as either empirical (quantitative or qualitative) or theoretical (normative or descriptive). Since logistics outsourcing as a field has emerged through industry practices, based and driven by business decisions and managerial practices, academic studies tend to favour more empirical (quantitative) research. However, perhaps because it is an emerging practice within operations management, a shift towards more theoretical rigour was also identified in the systematic review of the literature. As the field develops towards the building of theories and theoretical models, the review also demonstrated a shift from quantitative to qualitative empirical studies.

As of now, there is no universal theory or model that explains outsourcing or service provision in general, representing a dearth of theoretical and qualitative research. Consequently, academic studies in the area of operations and supply chain management should move towards a convergence of theory and practice in service outsourcing research, which this thesis addresses by contextualising service provision boundaries with empirical qualitative case data.

The Frequency of Logistics Outsourcing Research in SCM

Service outsourcing, and the logistics function in particular, became essential to business strategising in the 1990s (Bowersox 1990), when firms and global manufacturers started to recognise the potential benefits in terms of improving their competitive position (Zacharia and Mentzer 2004). Delivery speed, reliability, reduced distribution costs and responsiveness, constitute the major competencies that logistics services offer, which provides a competitive advantage through the value creation for the customer. Building

on the findings of the SLR (see Appendix D), this thesis argues that prior research has primarily focused on the benefits of outsourcing to a focal firm; however, little attention has been paid to the perception of the service providers and their corresponding motivations and benefits. Furthermore, Zacharia and Mentzer (2004) stress the rising importance afforded to logistics within organisations, which supports the increasing interest in logistics outsourcing research.

In sum, the identified salience in the form of occurrence and frequency of logistics outsourcing articles within other management journals has not changed significantly over time. However, the field of logistics outsourcing shows a clear interest within a small number of academic journals (see Table D.5). Hence, this thesis argues that the subsequent argument of systems integration based on logistics outsourcing from the providers' perspective might reach a broader audience and therefore increase the academic interest in service provision and the definition of service boundaries.

The Impact on the Field of Logistics Outsourcing

Service outsourcing research and corresponding scholarship is grounded in other closely related social science disciplines, such as economics, accounting, marketing, operations management, strategic management, sociology, political sciences and psychology. As cited by (Lockett et al. 2006), management literature is very closely related to the social sciences of economics, psychology and sociology (Pieters and Baumgartner 2002). However, given the fact that service provision originated in business practices, economic and the accompanying management fields have been more influential than those situated in political sciences, psychology or sociology. Interdisciplinary research serves as the basis for a widespread application of theories (Stock 1997), as is reflected in the field of operations management, service provision and outsourcing in particular. In addition, supply chain management continues to interact with other disciplines, such as marketing and strategic management in both the academic and the business world. In response to the first research question and based on the findings of the systematic literature review, theoretical knowledge and research about service outsourcing has thus been derived from other management and related social science disciplines. Table D.6 and Table D.7 in Appendix D presents the detailed citation counts of logistics outsourcing articles in core management fields.

The findings of the systematic literature review conclude that service outsourcing research has adopted theories from a multiplicity of disciplines spanning across the social sciences and management fields. However, as the field matures and progresses, the review also proposes that the proportion of “imported knowledge” (Lockett et al. 2006, p.120) has decreased over time. Nonetheless, an interdisciplinary approach is still needed in order to theorise about the phenomenon of logistics outsourcing, in particular service provision boundaries, and to increase its validity and applicability to other relevant areas of study. Hence, this study addresses the requirement to import knowledge by adopting a multiplicity of theoretical constructs that origin in economics, sociology and organisational studies.

6.1.2 Response to Research Question Two

In light of the lack of theoretical concepts in service provision and logistics (Bolumole et al. 2007) that explain the boundaries between internally and externally provided services, the second research question addresses the need for a conceptualisation of service provision boundaries, as was expounded in chapter two.

Research Question Two: *How can the combination and the multiplicity of existing theories from different disciplines explain the provision of services boundaries from the provider firms’ perspective?*

Following the second research question, a multi-theoretical framework was developed and served as a starting point for the main contribution of this thesis regarding the definition of service provision boundaries and the development of a service provision continuum. The proposed conceptualisation (see Figure 2.13) focuses on four different archetypes of service provision, and how these relate to each other from the provider firms’ perspective. In addition, once we understand how the boundaries of different archetypes of service provision are defined, a link to the continuum of service provision and the role of systems integration can be made (see research question four). Common economic as well as sociological theories were reviewed and considered for their applicability to explain and describe service provision boundaries. Following an initial review of management literature on outsourcing practices and service provision, four managerial issues guided the further literature review and conceptualisation process as well as the development of the research questions. These issues, as they came to the researcher’s attention, refer to the theoretically derived constructs and include (1) the firm’s core competence, (2) the governance structure for outsourced logistics services,

(3) the proper organisation of relational or contractual arrangements and (4) the need for systems integration capabilities. As was introduced in chapter one, these issues regarding logistics outsourcing and service provision follow certain theoretical constructs that are based in RBV, TCE, AT and the business of systems integration (SI). Consequently, the initial framework for this thesis consists of a multiplicity of comprehensive theories (see Figure 6.1).

In sum, the developed theoretical constructs in line with the initial conceptual framework co-exist under the phenomenon of logistics outsourcing and service provision. Hence, the four proposed theories, as suggested by the initial conceptual framework that was derived from the literature, explain the phenomenon in *combination*.

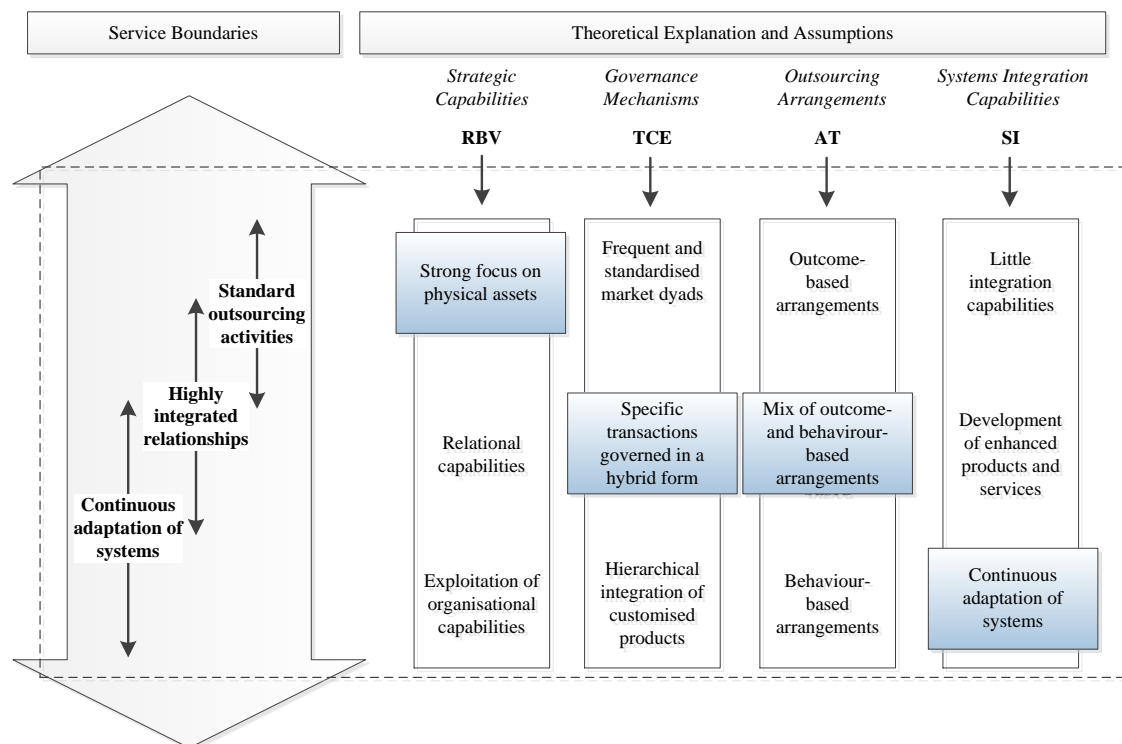


Figure 6.1: Initial Conceptual Framework of Service Provision Boundaries

The findings of the case studies, therefore, demonstrate that a multi-theoretical framework is necessary to explain service provision boundaries, as is discussed below. The findings from the cross comparison of the four archetypes, which is discussed in section 6.1.3 of this chapter, revealed how each archetype employs their capabilities and governance structure differently, highlighting the continuum of service provision.

(1) What is a Service Provider Firm's Core Competence?

The literature review has revealed that, based on the assumptions about competitive advantages made amongst business strategists, management research generally promotes the idea that a firm must only focus on a single core function (Porter 1985, Prahalad and Hamel 1990, Quinn and Hilmer 1994, Quinn 1999), which should preferably be exploited in a way that increases a focal firm's value and Ricardian rents (Penrose 1959, Olavarrieta and Ellinger 1997). This thesis relates these concepts and the theoretical assumptions of RBV to the context of service provision and the logistics industry by suggesting that such core competences can primarily be defined by a provider firm's logistics resources (Day 1994, Halldórsson and Skjøtt-Larsen 2004, Bolumole et al. 2007). Barney (2001a) highlights the advantages of focusing on core competencies through outsourcing and links the outsourcing decision to the resource-based view (RBV) theory. Therefore, the initial conceptual framework in this thesis adopts his reasoning by arguing that strategic capabilities, in the form of tangible and intangible resources represent determinants for the boundaries of different archetypes of service provision. The identified four constructs that explain the strategic capabilities in the context of logistics outsourcing and therefore serve as the basis for understanding service provision boundaries, are 'physical assets', 'relational capabilities', 'organisational capabilities' and 'knowledge' as well as 'know-how'.

'Physical' and 'peripheral assets' (Karia and Wong 2013) include equipment, such as transportation and warehousing units. Provider firms, however, happen to be idiosyncratic and the appearance and exploitation of such physical resources is found to vary within different archetypes of service provision.

'Relational capabilities' (Hartmann and De Grahl 2011) include closeness to customers in terms of the provider firms' dependency on customer orders. Different archetypes of service provision, such as LSC firms, for instance, place their emphasis on trustworthy relationships with customers to guarantee utilisation of their capacities instead of long-term contractual arrangements.

'Organisational capabilities' (Karia and Wong 2013) include the ability of the providers to increase their scale and scope without merging or acquiring external capacities with regard to investment and expenses. Different archetypes of service provision, therefore, manage to either build their own global network or can easily join another one.

‘Knowledge’ and ‘know-how’ (Poppo and Zenger 1998, Barthelemy and Quelin 2006, Yeung et al. 2012) in the context of service provision in logistics systems refer to the different industry insight that provider firms have. Hence, different archetypes of service provision will develop expertise in various supply chain functions, such as procurement, replenishment, and distribution, etc. or in different contexts, such as retail or manufacturing.

It is important to note, as the literature suggests, that specific types and characteristics of resources differ amongst different archetypes of service provision. Interestingly, the findings of this thesis show that a single resource, as in Barney’s terms, cannot be fully representative for a sustained competitive advantage. Hence, a combination of any physical-, relational, organisational- and knowledge-based resources is different for any archetype of service provision and is therefore a necessary requirement to take into account when describing service provision boundaries, which is why it is part of the initial conceptual framework in this thesis.

Hence, from the service providers’ perspective, the conceptualisation of RBV suggests that the core competencies of service providers cannot be clearly defined by a single one resource. This particularly holds true for LSP (out) and LSP (inst) firms, insofar as they highly emphasise on physical assets and the development and provision of IT integration and network planning, for example, which corroborates Edith Penrose’s (1959) proposition that a firm is a bundle of products and services.

(2) How should Transactions be governed from the Service Providers’ Perspective?

Following the initial outsourcing decisions, services are governed in a market, hybrid or hierarchical form. Oliver Williamson (1975, 1985) introduced an explanation of pure in-house versus outsourced operations. However, the decision whether to govern in-house (market), externally (hierarchy) or via a collaborative relationship (hybrid) depends on the nature and characteristics of a firm’s specific outsourcing processes. In order to conceptualise service provision, from the provider firms’ perspective, the following four constructs of ‘uncertainty’, ‘asset specificity’, ‘small numbers bargaining’ and ‘monitoring costs’ determine the nature of the outsourcing governance structure with regard to service providers in the logistics industry.

‘Uncertainty’ (Poppo and Zenger 1998, Barthelemy and Quelin 2006, Hsiao et al. 2010b, Reeves Jr et al. 2010, Lai et al. 2012) and ‘frequency’ (Chu and Wang 2012), with regard to logistics services primarily refers to seasonality. Within different industries, such as automotive, high-tech or consumer goods, provider firms face a constant demand of basic services with peaks in the holiday or seasons, which favours a hierarchical structure. Uncertainty, with regard to logistics services, can also be predicted insofar as provider firms specialise and target their services in a niche market, forming a hierarchical structure.

‘Asset specificity’ (Poppo and Zenger 1998, Vandaele et al. 2007, DeVita et al. 2010, Hsiao et al. 2010b, Kutlu 2012, Tsai et al. 2012, Karia and Wong 2013), as it appears in logistics transactions, impacts the initial investment costs from the provider firms. Hence, not all archetypes of provider firms are willing to acquire highly specific equipment or facilities required for transportation, storage or material handling processes. Hence, the providers’ willingness to bear financial risk depends largely on their service portfolio and impacts the governance structure, accordingly. However, small-scale providers, insofar as they specialise on a niche market, are also likely to invest into new machinery and equipment that is specialised and targeted towards a particular project or bid, which contradicts their preferred market structures.

‘Small numbers bargaining’ (Chu and Wang 2012) in the context of logistics transactions clearly represent the number of competitors within a market. Hence, the more standardised and basic the processes are, the higher the competition. As a response to this competition, differentiation is difficult for small-scale provider firms (i.e. LSC firms), which lack strategic capabilities. As a result, only highly integrated service providers (i.e. LSP (out) and LSP (inst) firms) manage to leverage their buying and bargaining power.

‘Monitoring costs (*ex-ante*)’ (Poppo and Zenger 1998, Lai et al. 2012) are most relevant to the efforts of controlling and tracking providers’ performance and outcomes, and therefore attract most attention with regard to highly integrated or complex logistics operations (i.e. for LSP (out) and LSP (inst) firms). Here, monitoring is essential to guarantee customer satisfaction, however, the willingness to share information has deemed to be problematic. Interestingly, as one would expect, information about basic and standardised activities, such as transportation and warehousing, are readily available. However, this information contributes to the sub-tier providers’ (i.e. mostly LSC firms)

leveraging power, insofar as highly integrated services offered by LSP (out) firms and even customer-centric solutions offered by LSI firms require total information transparency. Hence, even low-level tracking and tracing information from sub-tier LSC firms is valuable for total supply chain visibility. Referring to monitoring costs and the governance structure, there is a dilemma between market governance and hierarchical governance. On the one hand, basic service provision is traditionally governed in a market, whereas a hierarchy would increase the ease of accessing information. On the other hand, highly integrated services that are governed hierarchically are required to buy information from basic provider firms in a market governance.

Hence, the selected governance structure concerning logistics outsourcing and the service provision boundaries impacts the relational and/or contractual relationships between the provider firms and their customers, and therefore complements the initial conceptual framework adequately. Despite the fact that relational or contractual arrangements must be at least dyadic, the considered constructs in this thesis only relate to the provider firms' circumstances, while contributing to the understanding of their service provision boundaries. Therefore, and since we know that different archetypes relate differently to the above constructs, this thesis found that TCE assumptions are crucial in determining the service provision boundaries, without starting out from the perspective of customer or dyads.

(3) Determining Outsourcing Arrangements from the Service Providers' Perspective

Having established the determinants that affect the outsourcing decision and governance structures, the design of the appropriate outsourcing arrangement from the service providers' perspective needs to be justified. Thus, the constructs of 'goal incongruences', 'information asymmetry' and 'moral hazard' or 'adverse selection' were identified, which determine the provider firms' preference with regard to a behaviour- or outcome-based contract. At this point, and perhaps because this thesis only considers the provider firm, the contractual or relational nature of a relationship is not important. These constructs, which were derived from agency theory literature, include the following and relate to the service providers' perspective only.

'Goal incongruences' (Halldórsson and Skjøtt-Larsen 2006, Kim et al. 2007, Chu and Wang 2012) is deemed to be a dyadic phenomenon. However, provider firms in this thesis differ in their efforts they undertake in order to meet their customers' requirements.

Hence, it is more the willingness to align goals with the customers that differentiates archetypes of service provision and therefore contribute to the definition of service boundaries. Where high discrepancies exist, such as in the case of basic and standardised services, the provider firms favour more outcome-based contracts. On the other hand, highly integrated service archetypes adopt or follow a rather behaviour-based contract as they are expected to behave less opportunistically.

‘Information asymmetry’ (Zsidisin and Ellram 2003, Jayaram and Tan 2010, Chu and Wang 2012) in the context of this thesis appears when provider firms are hiding or not willing to share information. Hence, the different archetypes of service provision and their boundaries can be defined in relation to the amount of information that is available as well as to the provider firms’ willingness to share that information. This goes in line with the construct of goal incongruences, where provider firms can exploit their leveraging power, accordingly.

‘Moral hazard’ (Lai et al. 2012) as it occurs in service provision primarily relates to the provider firms capability of meeting the customers’ expectations and requirements. Hence, for the purpose of this thesis, different archetypes demonstrate such behaviour differently, insofar as basic and standardised services are more transparent and highly integrated services require additional monitoring efforts, from a customer’s perspective. However, the provider firm also employs these circumstances as it fairly relates to their leveraging power within a certain archetype of service provision. For instance, small-scale and basic logistics operations require particular attention, as these are usually part of a wider supply chain wide and more complex service solution, offered by highly integrated provider firms.

‘Adverse selection’ (Jayaram and Tan 2010, Whipple and Roh 2010) also relates to the customers’ capabilities of evaluating and assessing available service providers. However, from the providers’ perspective, the opportunities in the form of making service offerings as visible and transparent as possible, increases the competitiveness within a market or industry. In particular, basic and standardised services require actions because traditionally the selection of these carriers favours the buyer or customer, whereas by emphasising their service offerings, provider firms can take advantage of the concept of adverse selection, which goes in line with information asymmetry.

The initial conceptual framework considers each construct separately, despite the fact that some, such as goal incongruences and information asymmetry, might represent causal links. A comprehensive analysis of how each construct individually determines and affects the different archetypes of service provision offers a better explanation of service provision boundaries, as is proposed by this research. Hence, the determinants for the outsourcing arrangements consist of a multiplicity of factors that differ in terms of their importance and dependency on each other according to the four proposed archetypes of service provision, which ultimately help to describe and explain their boundaries, as was demonstrated in the within-case analysis in chapter four.

In sum, the application of constructs relating to agency theory that describe the boundaries of service provision contributes to addressing the second research question. Hence, a multi-theoretical perspective is required to include all the factors necessary to provide a comprehensive explanation of different archetypes of service provision.

(4) Why is there a Need for Systems Integration?

Drawing on the emerging role of systems integrators in manufacturing and other large-scale industries that demonstrate highest form of relational complexities, such as defence systems, public health care and industrial power plant systems (Caldwell et al. 2009, Lewis and Roehrich 2009, Roehrich and Lewis 2014), a final contribution to the understanding of service provision boundaries is that of explaining the role of systems integrators in logistics systems. First and foremost, however, the role and operations performed by a so-called integrator firm must be addressed. Referring to the aim of the second research question to conceptualise service provision boundaries, Davies (2003) served as a starting point. He stresses the downstream integration of services as a crucial step towards becoming and developing systems integration capabilities (Prencipe 2003, Davies 2004, Davies et al. 2007). In the context of this thesis, and as a complementary subset in the initial conceptual framework, this conceptualisation was adopted by including three constructs regarding the development of ‘products, service and systems’ (PSS), the ability to ‘adapt to market changes’ and the ability of ‘interaction with customers and end-consumers’, as these were identified in the literature. Furthermore, the systems integration capabilities were adapted to the provider firms’ perspective of service offerings in the logistics industry.

‘Adaptation to market changes’ (Persson 1993b, Genchev 2009) within the context of logistics service provision mostly refers to changing customer orders and short-term operations, as was evidenced amongst basic and standardised service archetypes, such as for LSC or LSP (out) firms. However, the idea of adaptation, as was outlined in the literature review, was expected to be primarily conceived by highly integrated provider firms like LSI firms. As the findings suggest, adaptation to market changes amongst highly integrated provider firms lacks of a proper execution because the systems they are operating in are too large and changes are only achievable long-term. Hence, smaller-scale or less integrated provider firms take the opportunity to adapt to changes much quicker and therefore take over integration roles on a short-term basis. As was found in chapter four, adaptation capabilities are higher for low-level service firms than potential systems integrators.

‘Product, service and systems’ (Persson and Virum 2001, Gammelgaard 2004, Shook et al. 2009), in a logistics context refers to the development of enhanced products and service solutions within logistics offerings. The findings suggest it is primarily the organisational and relational capabilities, as they are present amongst LSP (out) firms, which allows these large-scale providers to incorporate customer-specific solutions. However, this study suggests it is not the customers themselves that are the initial driver for such development, but rather the service providers’ strive for greater integration leads such behaviour.

‘Interaction with customers and end-consumers’ (Fawcett et al. 2010a, Holmberg 2000) was identified as a crucial assumptions in integration literature and refers to customer-centric service solution. This thesis, however, emphasises on the ability to communicate and capture customer and end-consumer requirements from the provider firms’ perspective. Hence, the conceptual framework proposes that there are different efforts and capabilities amongst the four archetypes of service provision, with regard to interaction with customers and end-consumers. One would expect customers to be the drivers for innovation, leading on new product development (NPD) or customised supply chain solutions. However, the findings suggest that particularly for highly integrated services, the provider firm initiates innovation and communication efforts by gathering consumer data in order to predict and anticipate consumer behaviour. Furthermore, customers are not even interested in this information or interaction efforts, as they solely rely on the providers’ capabilities and efficient supply chain operations.

The application of these constructs has proven valuable when it comes to explaining (integrated) services and solutions that are offered across supply chains or other large-scale industries. Looking only at what and how services are outsourced does not provide a comprehensive view on the boundaries of service provision, which raises the question of why these service solutions have been developed. However, the initial idea of integrating systems and providing high value-adding solutions and CoPS (see section 2.7.3 for the assumptions and determinants for such behaviour) are based in manufacturing and large-scale production industries (Prencipe et al. 2003) and in the provision of capital goods (Davies et al. 2007). In response to the second research question, enhancing the initial conceptual framework with SI related constructs demonstrates and strengthens its applicability of systems integration capabilities within the logistics industry. This follows Andrew Davies' (2004) original conception of a value stream approach for manufacturing firms.

6.1.3 Response to Research Question Three

Moving away from the extant literature, the third research question incorporates the empirical findings from the investigation of service provision, as a result of the within-case analysis, as was presented in chapter four.

Research Question Three: How do provider firms within different archetypes of service provisions exploit their idiosyncratic and individual capabilities?

Having developed an initial conceptual framework, which served as the basis of the empirical analysis of interview data, service boundaries within logistics systems can be defined, insofar as they relate to the characteristics of 'exploiting strategic capabilities', 'governance mechanisms', 'outsourcing arrangements' and 'systems integration capabilities'. These individual characteristics amongst the proposed archetypes of service provision are discussed below. Hence, addressing the third research question (by investigating characteristics within different archetypes of service provision) the discussion below demonstrates that there is no clear behavioural characteristic present and the findings, therefore, suggest certain dynamics within each service archetype. The empirical service provision boundaries are presented in Table 6.1. These dynamics become important when the continuum of service provision is proposed, following research question four (see next subsection) and the cross comparison of the archetypes (see chapter five).

Boundaries within LSC Service Provision

LSC firms: Provider firms possess privately owned assets to operate standard logistics services; no supply chain integration or interaction with final customers is present; market transactions.

Referring to the within-case analysis of the archetypes of LSC service provision in chapter four (see section 4.1), the following key findings, focusing on the service provision boundaries, are discussed below: First, the findings suggest that provider firms operating within the LSC archetype show extreme differences in employing governance mechanisms and outsourcing arrangements (Figure 4.1). Second, the exploitation of strategic capabilities and systems integration capabilities show relative similar importance amongst the investigated case firms. Third, strategic capabilities are the most and systems integration capabilities are least representative characteristics of this archetype of service provision. Hence, these findings support the highly competitive market for basic and standardised operations.

This archetype of service provision focuses relatively little on the employment of governance mechanisms, such as uncertainty and bargaining issues. However, there are discrepancies present amongst LSC firms, where most firms use their resource capabilities (see below) to address uncertain demand in the form of adjusting capacities accordingly by maintaining market structures. One firm, however, adjusts their governance towards downstream integrated service providers. LSC firm 20 builds stronger customer relationships in order to overcome uncertainty by leveraging its bargaining power. Furthermore, conducting logistics outsourcing operations and the underlying contractual or relational arrangement is mostly conceived as relatively little and typically follows outcome-based contracts. These rather outcome-based arrangements corroborate with what we know from the literature, where goal incongruences and information asymmetry is neglected Chu and Wang (2012). However, LSC firm 20, actively aims to mitigate goal incongruences by establishing behaviour-based arrangements, following a long-term relationship. These attempts of establishing long-term and close relationships contradict the theoretical assumptions that provider firms tend to act in their own interest and therefore hide information, for instance (Lai et al. 2012).

Referring to strategic capabilities, the high exploitation of physical assets amongst LSC firms corroborates with what Karia and Wong (2013) found, insofar as these tangible

resources support the core competence of logistics firms and therefore represent the provider firms' primary focus. Emphasis is on the exploitation of scarce resources in order to benefit from pursuing automation and economies of scale (Reeves Jr et al. 2010). Systems integration capabilities have little impact on service characteristics for LSC firms and tend to be widely underdeveloped. In particular, adaptation to the external environment and changing customer requirements have strong potential to forge systems integration capabilities within this archetype of service provision. However, the findings suggest that the case firms typically show little interest in developing more enhanced products or service solutions, due to their lack of organisational capabilities.

In sum, the characteristics of market adaptation contribute to the proposed continuum of service provision, when low-level LSC firms go beyond their boundaries and operate within other service archetypes. The contextualised framework (Figure 6.2) illustrates their behaviour of moving up towards the provision of LSP services.

Boundaries within LSP (out) Service Provision

LSP (out) firms: Providers partly owns physical assets, but LSP (out) focus is on providing intangible capabilities, such as national, European or global distribution network; continuous and simultaneous communication with multiple upstream suppliers and manufacturers; limited interaction with downstream customers or end-consumers.

Referring to the within-case analysis of the archetype of LSP (out) service provision in chapter four (see section 4.2), the following key findings, focusing on the service provision boundaries, are discussed below: First, governance mechanisms and outsourcing arrangements amongst the investigated case firms within LSP (out) service provision demonstrate highly diverse characteristics. Second, the findings suggest that strategic capabilities do not show large variances between the investigated firms within this archetype of service provision, insofar as these capabilities are mostly exploited to a medium level, focusing on intangible resources. Third, systems integration capabilities are exploited very little amongst some firms but very highly amongst others within this archetype. Hence, the findings support that LSP (out) firms are extremely idiosyncratic and depending on the industry they are operating in, adjust to the competitive requirements, such as agility in the fashion industry, cost effectiveness in the retail industry or effectiveness in the manufacturing industry.

Surprisingly, firms show no common governance structures within the archetype of LSP (out) service provision. Hence, and in line with TCE theory, hybrid forms are employed, which favour the provider firm in addressing uncertainty and bargaining issues. In addition, and following Chu and Wang's (2012) argument, the findings suggest that LSP (out) firms have two ways to increase their leveraging power – against their customers. First, they operate and act as an expert in a niche market (i.e. uncertainty increases transaction costs towards the customers. Second, they offer large-scale and scope operations to a multiplicity of customers (i.e. market transactions with various sub-tier suppliers reduces transaction costs for the provider due to economies of scale). Either way, LSP (out) firms manage to increase the switching costs for the customers, regardless of the industry, and from a providers' perspective this increases leveraging and bargaining power.

Referring to the exploitation of strategic capabilities, the provider firms within the archetype of LSP (out) services place less emphasis on physical assets or tangible resources, but rather increase their relational and organisational capabilities in the form of establishing stronger relationships due to long-term contracts and spreading out their available capacities across multiple supplier firms. Such behaviour results in maintaining a strong logistics and distribution network that is cost efficient due to the high leveraging power amongst LSP (out) providers. These findings corroborate Barney and Clark's (2007) understanding that emphasising on intangible resources that cannot be bought easily by other providers, such as knowledge, relationships, industry know-how or a long-lasting partner network, therefore, represent a source for a sustained competitive advantage.

In addition, the findings suggest that systems integration capabilities amongst LSP (out) firms are typically limited to the provision of enhanced services and do not show any attempts of market adaptation or customer interaction. However, some firms eventually happen to find themselves in a situation, where they act as integrators by providing more abstract and integrated solutions, such as operating an online store or customer service centre. Nevertheless, on these occasions, LSP (out) service provision does not go beyond its conventional boundaries in the form of moving away from its core competencies and rather borrows ideas from such experiences, which they will bring back into their conventional service offerings later. Hence, further integration capabilities such as closer

interaction with customers from any industry is not evidences, neither is the quick adaptation to market changes.

In sum, LSP (out) firms place most emphasis on strategic capabilities and, therefore, this archetype of service provision can be defined by the exploitation of relational and organisational capabilities that develop over time through the establishment of a strong and long-lasting supply base of sub-tier carriers.

Boundaries within LSP (inst) Service Provision

LSP (inst) firms: Assets are partly owned by the provider firms but primarily shared with one major customer; provider firms manage and organise all information flows between the customer and sub-tier suppliers (upstream) as well as downstream consumers.

Referring to the within-case analysis of the archetypes of LSP (out) service provision in chapter four (see section 4.3), the following key findings, focusing on the service provision boundaries, are discussed below: First, systems integration capabilities represent bi-polar characteristics (i.e. either low or high) amongst firms within the archetype of LSP (inst) service provision. Second, governance structures and outsourcing arrangements play little importance within the presentation of the provider firms' service offerings. Third, from the provider firms' perspective, strategic capabilities are highly important but only in terms of relational and organisational capabilities.

The findings of the within-case analysis of LSP (inst) service provision suggest that provider firms operating within this archetype demonstrate changing behaviour in employing integration capabilities. On the one hand, most firms are not able to go beyond their boundaries of service provision and are limited to the focal firm's structure and service requirements. On these occasions, the only capabilities that are exploited are relational and organisational ones in the form of achieving cost-effective logistics solutions by leveraging their bargaining power towards sub-tier supplier firms. This leveraging power is, however, primarily based on the focal firm's provision of physical assets and resources. On the other hand, some LSP (inst) firms actively approach the focal firm's customers and even end-consumers in the form of managing online shops and customer interfaces. However, here the provider firms are still bound to their customer's organisational structure, which does not allow them to develop own integration capabilities. Hence, these enhanced and consumer-centric operations are only of a short-

term nature, which implies that the developed knowledge and expertise cannot be properly adapted and ultimately contribute to the provider firms' competitiveness. These findings corroborate with what Genchev (2009) found, in the form of implementing reverse logistics operations, that the acquisition of knowledge results in impressive improvements of shipping accuracy, for example.

Referring to the governance structure and outsourcing arrangements amongst firms within the archetype of LSP (inst) service provision, the findings suggest that contractual issues as well as uncertainty and transaction costs are not considered relevant at all, in terms of their impact on the service boundaries. This is due to the straightforward and pre-defined nature of the organisation of logistics services when driven by the focal firm. The findings further suggest that the existence of LSP (inst) service providers entirely mitigate the risks associated with adverse selection and moral hazard for the focal firm. Hence, from the providers' perspective this becomes interesting, insofar as *ex-post* monitoring costs do not appear. This in turn results in the ability to freeing up internal capacities in the form of human capital that can be targeted to increase operations efficiency. This phenomenon was certainly not anticipated, because the traditional perspective of integrated logistics service provision is considered as customer-centric and focused on mitigating goal incongruences, which is not supported within LSP (inst) service provision. Subsequently, LSP (inst) firms did not demonstrate much of the expected willingness to align their goals because they are limited and bound to their single customers' organisational values and structure.

Similar to the provision of LSP (out) services, LSP (inst) firms primarily focus on exploiting intangible resources, such as knowledge and know-how (Teece et al. 1997, Barney and Clark 2007). Hence, the physical assets are provided by the customer, which also allows the provider firms to use their human capital and skills to providing service bundles and solutions, rather than focusing on operational activities, such as transportation and warehousing.

In sum, LSP (inst) boundaries reflect rather integrated services in the form of delivering larger scopes of the offered services, focusing on intangible resources. However, the findings suggest a key distinction in that these services still include asset-heavy operations, where the providers' customer owns the assets. Hence, an abstract or transcendent integration in the form of providing enhanced PSS and service solutions is

possible but cannot be executed as desired because the institutional boundaries of the single customer limits their ability to further exploit and enhance systems integration capabilities. This dilemma mostly refers to the above mentioned limitations of aligning goals and willingness to share information, which are also driven by the customer.

Boundaries within LSI Service Provision

LSI firms: Owned assets solely support the facilitation of integrated solutions; LSI firms place emphasis on the continuous communication with (downstream) customers and/or end-consumers; they primarily rely on their organisational capabilities; LSI firms delegate agency across the supply chain with multiple customers in a hierarchical governance form.

Referring to the within-case analysis of the archetypes of LSI service provision in chapter four (see section 4.4), the following key findings, focusing on the service provision boundaries, are discussed below: First, the findings suggest that even for the highest proposed form of service provision, strategic capabilities represent and contribute largely to the operational and tactical execution of integrated operations, with a focus on physical assets. Second, governance mechanisms and outsourcing arrangements do not follow a particular structure amongst LSI firms and vary within this archetype of service provision. Third, systems integration capabilities are highly employed with regard to developing and providing services, spanning upstream and downstream logistics solutions.

Within the archetype of LSI service provision, the findings suggest that tangible resources in the form of physical assets, such as transportation units and warehouse facilities, are a necessary requirement in order to provide highest customer-centric service solutions. This implies, and referring to Penrose's (1959) proposition to view firms as a bundle of products and services, that even service solutions rely on the easy access to such physical logistics assets. Despite the theoretical and rather abstract assumption of providing supply chain wide *solutions*, all investigated LSI firms in this sample do not just incorporate (i.e. exploit) these assets but also privately own them. However, the focus lies not on managing these tangible resources, which implies that, from the providers' perspective, dependence on sub-tier suppliers remains high. Perhaps because logistics assets are relatively easy to imitate and substitute across any supply chain context (i.e. fashion, retail, manufacturing industries require similar assets and logistics equipment), LSI firms place emphasis on including these resources into their service offerings. Furthermore, the relevance of established external relationships becomes evident, insofar as LSI firms

exploit their sub-tier providers' assets, which then contributes to the ability to provide bundled services that include tangible and especially intangible resources, such as industry knowledge and organisational capabilities. These organisational capabilities allow LSI firms to offer their services on a larger scope amongst different industry supply chains.

In a similar vein and in line with the above point of no clear separation between physical assets and intangible capabilities, LSI firms employ contractual and relational arrangements randomly, depending on the actual nature of a project or operation. This aspect of identified systems integration in the context of logistics consequently implies that LSI firms, in this sample, use these capacities to adapt to the unique circumstances of a particular contract. Hence, this behaviour also undermines the expected integrator role on a strategic and rather abstract systems level. The findings suggest that this highest form of supply chain wide integration employs both outcome-based and behaviour-based contracts. LSI firms in this sample, as illustrated in the contextualised framework, adapt to lower level service provision by eliminating the abstract ties associated with behaviour-based contracting. Hence, they operationalise standardised and basic logistics activities via outcome-based contracts in order to overcome uncertainty of demand. Therefore, they do not neglect at all the risks associated with adverse selection and moral hazard. Because this rather operational thinking (as opposed to a systems-wide approach) implies high costs associated with monitoring sub-tier suppliers and organising supply chain wider interactions. Consequently, the findings suggest that the strict hierarchical governance structure is a pitfall in establishing integration roles, because such a structure is deemed to create unexpected and high organisation and administration efforts.

Drawing on the providers' perspective of systems integration, the development of enhanced PSS and the changing role from a manufacturing or service towards being an integrator firm, as was proposed by Prencipe et al. (2003), the findings suggest that there is evidence for such behaviour amongst LSI firms in this sample. These LSI provider firms actively employ the coordination of information about customer and end-consumer behaviour that anticipates future demand for products and services. From the providers' perspective, and in the context of this thesis, service solutions can therefore be adjusted according to the customers' unique requirements. However, these established supply and demand networks – even though they are controlled and orchestrated by LSI firms – require severe maintenance and monitoring activities that represent the primary barriers

towards the achievement of full supply chain visibility and transparency. In sum, LSI service provision boundaries are determined by their high integration capabilities in the form of customer and end-consumer interaction. Due to their primarily hierarchical structure, this archetype of service provision has access to tangible resources and furthermore must exploit these externally accessible assets, if not owned by the LSI firms themselves. LSI firms place emphasis on the organisation of multiple contractual and relational arrangements that require constant maintenance and monitoring. These costs are subject to be mitigated which includes efforts driven by the LSI firms to overcome information asymmetry by adopting outcome-based contracts, where sub-tier suppliers (i.e. carriers) are forced to present relevant shipment and product-related data; this also increases the ease of accessibility to information.

In response to research question three, different archetypes of service provision require different combinations of systems integration capabilities. For LSC and LSP (out) service provision the emphasis lies on the provision of standardised and separate services, whereas LSP (inst) and LSI firms provide more integrated and adaptable solutions. However, the findings suggest that there is no clear distinction between service boundaries, which supports the proposed contribution of developing a service provision continuum, as is further addressed when answering research question four.

6.1.4 Response to Research Question Four

The analysis of the case studies and interpretation of the interviews in this thesis contribute to the development of a service provision continuum and to the understanding of systems integration in the context of logistics services. The fourth research question addressed the phenomenon of how the identified archetypes of service provisions relate to each other. Hence, the cross comparison in chapter five led to the development of an overlapping continuum in service provision.

Research Question Four: *How can the boundaries across different archetypes of service provision be delineated?*

In response to the fourth research question, this thesis proposes the development of a service provision continuum. The findings suggest that firms go beyond their traditional boundaries by adapting behaviour that is typical for another archetype of service provision. Such continuum and changing behaviour from the service providers' perspective is illustrated in the contextualised framework (Figure 6.2). Furthermore,

several propositions underline and support this anticipated development (see Table 6.1), which is discussed in the next section. The service provision continuum, as is illustrated in the contextualised framework (Figure 6.2) highlights the unexpected findings of overlapping characteristics from the case study analysis and demonstrates the changing behaviour of provider firms that form the four proposed archetypes.

First, LSC firms offer services that span beyond their conventional tasks of standard outsourcing activities. However, these provider firms remain a pure market structure even though they offer more integrated and customer-centric services.

Second, LSP (out) firms, in a similar way, share certain service offerings in the form of basic logistics functions, such as operational transportation and warehousing activities. These activities are standardised and entail little supply chain integration. Because for a customer, switching services usually combines switching both standard activities and more complex distribution networks, LSP (out) firms usually represent a hybrid governance structure; however, they also invoke in a market structure in certain occasions (i.e. when the activities the customer requires are highly standardised).

Third, LSP (inst) firms conventionally employ hybrid forms of governance when interacting with their customer, but become more hierarchical when delegating tasks to sub-tier suppliers. This happens when they break ties with their main customer and take on more of an integrator role. However, this only occurs when the LSP (inst) firms occasionally attempt to gain superior knowledge about end-consumer requirements. However, these attempts are not driven by their customer but solely by their own strive for developing advanced service solutions. Such circumstances may be rare but highlight that LSP (inst) firms are able to take over responsibilities that go beyond their traditional proposed boundaries. However, the knowledge and expertise acquired cannot be exploited further because this does not align with their customer's strategic goals. Consequently, LSP (firms) rarely, and if so only for a short-time period, have the opportunity to maintain a systems integration role.

Fourth, LSI firms come closest to the highest form of supply chain integration, representing a pure hierarchy, where agency is entirely transferred to partners and carriers along the entire supply network. However, this transfer of agency only applies to firms that empower their organising role of integration. In most cases, LSI firms tend to sacrifice this abstract and rather strategic integration role by taking the agency upon

themselves and manage and operationalise traditional LSP activities. This behaviour, however, evidences that there is not pure transcendence in the market, insofar as it is usually referred to as 4PL provision. The findings suggest that firms that take on systems integrator roles still gain their knowledge (i.e. expertise) by conducting low-level operations and engage with basic logistics activities, but at the same time holistically manage entire supply chains.

6.2 Beyond a Binary Discussion between Outsourcing and Insourcing (3)

The overall aim of this research is to contribute to the ongoing discussions in the field of operations management about systems integration that supersedes a binary view of insourcing and outsourcing, highlighting the service providers' perspective. In terms of contribution, service provision boundaries amongst provider firms, in the context of logistics, are re-defined and a continuum of service provision is developed. The following subsections summarise how the empirical data of this thesis characterise service provision boundaries and highlight a continuum of market, hybrid and hierarchy governance structure, from the providers' perspective. Building on the initial conceptual framework and the orientation of this study, this thesis solely adopts the providers' perspective in defining service boundaries.

6.2.1 Re-Defining Service Provision Boundaries and Contextualising the Findings

As a result of the iterative data collection and analysis methods applied in this thesis, the contextualised framework illustrates the empirical findings of this study. Furthermore, several additional propositions have been put forth (Table 6.1) that address future research on the role of systems integration and the boundaries of service provision, which are discussed in section 7.6. The suggested propositions relate to the four evidenced shifts across service provision boundaries as illustrated in Figure 6.2. Notably, the within-case analysis helped to define each archetype's service boundaries and also helped to identify various dynamics within each archetype. The cross comparison of the archetypes then supported the proposed continuum of service provision. Hence, the provider firms go beyond their traditional boundaries of service provision and adopt other characteristics in order to excel their service capabilities. Table 6.1 gives an overview of the key factors for the different archetypes of service provision and work to refine the contextualised framework.

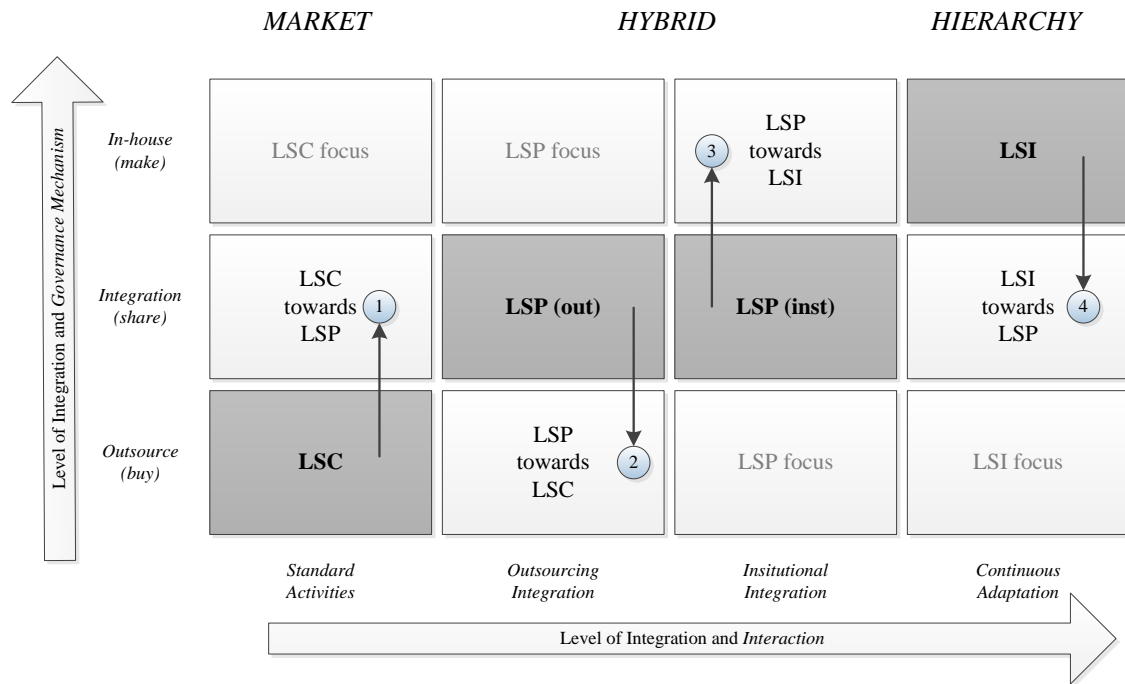


Figure 6.2: Contextual Framework on the Service Provision Continuum

Further to the development of a service provision continuum, Table 6.1 complements the contextual framework by summarising key characteristics and propositions.

Empirical Findings of Service Boundaries and Continuum	
<i>LSC</i>	Provider firms possess privately owned assets to operate standard logistics services; no supply chain integration or interaction with final customers is present; market transactions.
Proposition One: When basic service providers, such as LSC firms offer a combination of customer-centric services that extend beyond the basic service boundaries of providing physical assets, the governance structure of a market transaction remains.	
<i>LSP (out)</i>	Providers partly owns physical assets, but LSP (out) focus is on providing intangible capabilities, such as national, European or global distribution network; continuous and simultaneous communication with multiple upstream suppliers and manufacturers; limited interaction with downstream customers or end-consumers.
Proposition Two: When more integrated service providers, such as LSP (out) firms act as operators or carriers by providing standardised and asset-based operations, the governance form of a hybrid relationship reverts to those of a market transaction.	
<i>LSP (inst)</i>	Assets are partly owned by the provider firms but primarily shared with one major customer; provider firms manage and organise all information flows between the customer and sub-tier suppliers (upstream) as well as downstream consumers.
Proposition Three: When LSP (inst) firms act as integrators by independently providing supply chain solutions to their customer, the governance form of a hybrid relationship transitions into that of a hierarchical governance structure for only a short period of time.	
<i>LSI</i>	Owned assets solely support the facilitation of integrated solutions; LSI firms place emphasis on the continuous communication with (downstream) customers and/or end-consumers; they primarily rely on their organisational capabilities; LSI firms delegate agency across the supply chain with multiple customers in a hierarchical governance form.
Proposition Four: When LSI firms use their integration capabilities for one single customer by offering services that cover upstream distribution and downstream delivery of products, they represent a hybrid governance structure, despite attempts to maintain a holistic supply chain wide integrator role.	

Table 6.1: Summary of Service Provision Boundaries

Following the discussion on redefining service provision boundaries, the developed propositions and suggested service continuum is described below, which complements the contextualisation of the findings from the service providers' perspective.

Service Continuum exploited by LSC Firms

The initial conceptual framework only allocated highly standardised activities, such as warehousing and transportation operations, to the archetype of LSC service providers. The analysis of the case studies confirmed such a classification. However, it also showed that a clear separation of LSC firms from other archetypes is only represented by the ownership of physical assets and equipment, in terms of vehicles, storage units and handling equipment; and by the dyadic relationships to either a direct customer or a client, both of which act as principals. No other firm archetype purely focuses on the provision of these operational services and functions. Hence, ownership of any number of vehicles, logistics equipment and storage space defines the boundaries of LSC service provision. Additionally, the analysis reveals that the integration level of service provision can be increased through offering more customer-centric services by exploiting fixed assets, such as combining warehousing and transportation services. Despite the provision of extended services LSC firms retain their market-led governance structure and do not adopt a hybrid form, contrary to what the theory might suggest (i.e. what is expected for more integrated LSP (out) services). This study therefore suggests the following first proposition that refers to the findings from the LSC archetype:

Proposition One: *When basic service providers, such as LSC firms offer a combination of customer-centric services that extend beyond the basic service boundaries of providing physical assets, the governance structure of a market transaction remains.*

Service Continuum exploited by LSP (out) Firms

Referring to the initial allocation of services, all supply chain activities within a retail environment are covered by LSP (out) firms. The analysis of the case studies, however, reveals that LSP (out) services are very diverse and customised to specific customer requirements, while also representing a high degree of standardisation. Such behaviour best represents the continuum of service that are offered by one single firm, demonstrating the dynamics present in a single firm archetype (see chapter four), which ultimately adds to the complexity of developing a general service provision continuum. LSP (out) service providers are not necessarily defined by their ownership of physical assets or equipment,

but by their necessary capabilities and resources, in terms of human capital and peripheral IT solutions that allow for the exploitation of larger-scale replenishment and distribution operations. LSP (out) services, therefore, include operational activities, such as transportation and warehousing, which are subsequently sub-delegated to external third parties (agents). Services also include the provision of customer-centric distribution solutions, where LSP (out) firms tend to act as a principal, even though they are working on behalf of a retail customer, for instance. This controversial role of agency transformation, however, can be described by the changing governance structure in certain situations. Therefore, this thesis suggests the following second proposition that refers to the findings from the LSP (out) archetype:

Proposition Two: *When more integrated service providers, such as LSP (out) firms act as operators or carriers by providing standardised and asset-based operations, the governance form of a hybrid relationship reverts to those of a market transaction.*

Service Continuum exploited by LSP (inst) Firms

The existence of specialised and dedicated provider firms that organise and manage the entire logistics function for a single customer represents the service boundaries of LSP (inst) firms. Similar to other service providers, their range of operations goes beyond the provision of standardised activities and includes close supplier and customer interaction. However, this archetype of service provision eradicates the hybrid governance structure, evident in LSP (out) service relationships, and shifts to a hierarchical form. Such a discrepancy from conventional service providers highlights the highest form of flexibility, in terms of amending relational and contractual arrangements. LSP (inst) firms excel at efficient and effective supply chain operations perhaps because of their close customer relationship. Hence, LSP (inst) firms stand in contrast to LSP (out) firms, who foster dedicated and long-term relationships that mitigate the risk of opportunistic behaviour for both the provider and focal firm (i.e. customer). Therefore, the third proposition can be formulated as follows, referring to the findings from the LSP (inst) archetype of service provision:

Proposition Three: *When LSP (inst) firms act as integrators by independently providing supply chain solutions to their customer, the governance form of a hybrid relationship transitions into that of a hierarchical governance structure for only a short period of time.*

Service Continuum exploited by LSI Firms

Given that our understanding of systems integration and solution providers borders on the abstract and transcendent, the LSI firms defined here terms these integrator roles and facilitates the continuous adaptation of systems. With regard to the ownership of assets, LSI firms place little emphasis on market and hybrid governance. Instead, the delegation of agency and the capabilities related to customer interaction attract most consideration. Theoretically, LSI firms should implement a strict hierarchical structure within and across multiple supply chains simultaneously that would allow them to coordinate efficiently (and delegate agency). In practice, however, this hierarchical structure is nearly impossible to achieve, given that LSI firms tend to take on an inordinate amount of operational tasks and therefore act as agents themselves. Nonetheless, the findings show that LSI firms in this sample attempt to retain a rather hierarchical structure by maintaining a high level of interaction (and therefore facilitate a holistic supply chain integration), despite the fact that they also offer services that are rather operational and less integrated *per se*. In this way, the LSI archetype mostly represents a hybrid governance. Therefore, this thesis suggests the following fourth proposition that refers to the findings from the LSI archetype:

Proposition Four: *When LSI firms use their integration capabilities for one single customer by offering services that cover upstream distribution and downstream delivery of products, they represent a hybrid governance structure, despite attempts to maintain a holistic supply chain wide integrator role.*

6.2.2 The Role of Systems Integration vs. Insourcing and Outsourcing

Having discussed and developed a continuum of service provision based on the case study findings, this subsection emphasises the role of systems integration from the provider firms' perspective. A primary tenet towards understanding service provision boundaries is the role and nature of systems integration in the context of outsourced services. The evaluation and explanation of service provision boundaries alone, however, does not approach such an understanding to its full extent. As was outlined in the introduction chapter, integration capabilities find application across different industries given practical and current examples, such as Uber, Amazon, Facebook or Air B'n'B. The reference to, and the motivation for adopting such integrator roles to the context of logistics outsourcing is that of recent practices, as was experienced by global service providers, such as Panalpina, DHL or Kühne+Nagel, to name a few prominent examples. Their

integrator role, as of recent, primarily focuses on acquisitions and mergers in order to increase their organisational capabilities that allow them to provide their solution services to a wider scale and scope across different industries. In particular, the recent acquisition of Norbert Dentressangle by XPO Logistics⁴² resulted in extending XPO Logistics' capabilities in becoming one of the largest global players for advanced logistics services.

Controversially, in relation to the observed characteristics in other large-scale industries, where integrator firms do not own any assets (e.g. Uber does not have any taxis, Air B'n'B does not possess any accommodation facilities) or actively develop content (e.g. Facebook does not create content by itself), systems integrator roles, in the context of logistics services, seem to demonstrate different characteristics. Hence, the frequently cited idea of a '4PL provider' that does not possess any assets (Win 2008) and solely undertakes an orchestrator role (Dollet and Diaz 2011, Zacharia et al. 2011), remains theoretical and abstract. The findings of this thesis suggest that service providers, on the one hand, employ systems integration capabilities by moving downstream of the supply chain (i.e. holistically manage supply chain wide operations), but on the other hand, possess and even further acquire tangible resources in the form of physical assets, in order to incorporate those into their hierarchical structure.

At this point in the discussion, this thesis links the development of a service provision continuum to the initial view of insourcing and outsourcing. Outsourcing has played a large role in developing logistics competences, and therefore systems integration capabilities. Hence, the discussion suggests that outsourcing decisions, from the service providers' perspective, are primarily linked to the acquisition of resources and the development of integrated solutions. Therefore, the question of whether there is a need for systems integrators is largely indisputable. This thesis identified three discussion points that contribute to this emergence of systems integrators in the logistics industry.

First, the findings demonstrate that systems integration capabilities alone are not sufficient to fully manage and organise supply chain wide operations across various industries. Notably, a hierarchical approach, involving the sub-delegation of agency and various operational activities necessitates such systems integration capabilities, in

⁴² XPO Logistics is an American third-party service provider, headquartered in Greenwich, Connecticut with an annual revenue of USD 2.4 bn. in 2014.

particular those of developing PSS and the ability to adapt to market changes, which requires the control and acquisition of sub-tier suppliers' assets or equipment.

Second, firms that operate across various industries, be it in retail, manufacturing or services, more generally, tend to rely on their own internal capabilities of organising and structuring supply and demand and the corresponding operations. However, given the speed at which markets are changing, especially as it pertains to increased and specialised customer requirements, the need for an external coordinator or orchestrator has increased (Zacharia et al. 2011).

Third, the distinction between systems sellers and systems integrators (Davies et al. 2007) is worth mentioning at this point. Due to the multiplicity and complexity of supply networks, their organisation requires both the management and monitoring of individual components, parts and elements, which could represent particular supplier relationships, transportation links or inventory planning. However, in the context of this thesis, only a hierarchical structure with regard to systems integration capabilities can fulfil such requirements.

In sum, systems integrators, in this thesis, are identified as the only archetype of service provider that have the capability to make such holistic organisations feasible and manageable. In addition, referring to the contextualised framework, the development of these integrator firms implies that there is still some room for a transition within and even beyond the abstract and transcendent perception of systems integrators. Such a transition would ultimately enhance the operational performance of the entire supply and demand network. Even though a linkage between the systems integration capabilities and the achieved performance outcomes is not directly addressed in this research, such a conceptualisation is nonetheless proposed based on the exploratory findings of this research. Therefore, the discussion about the role of systems integration concludes with the following fifth proposition that refers to the applicability of the proposed service provision continuum:

Proposition Five: *When customer requirements and end-consumer behaviour is rapidly changing, provider firms can take over a systems integrator role in order to increase supply chain wide (or systems wide) performance, by increasing supply chain visibility due to close downstream and upstream interactions.*

6.3 Reflection and Concluding Thoughts

The following section concludes the discussion of the findings by reviewing the theoretical, methodological and managerial implications of this thesis. The following sections also offer a reflection on the research process and approach.

6.3.1 Addressing the Theoretical Discussion on Service Boundaries in OM

This thesis and the entire research process undertaken worked towards developing an understanding of the theoretical underpinnings for service provision in logistics as well as systems integration. Having started with a broad view of conventional economic theories and governance relations, this thesis narrowed the various perspectives to a manageable size. As a result, the identified constructs from different economic (RBV and TCE) and sociological (AT) theories highlight two discussion points, considering the multi-theoretical perspective and the development of a service provision continuum.

First, a single theoretical perspective cannot exclusively explain the presented phenomenon. Due to the complexity and multiplicity of supply chain wide interactions that are involved in outsourcing processes, a comprehensive multi-theoretical view is most appropriate and particularly acknowledges the context of service provision. Therefore, this thesis contributes to the development of knowledge in operations management by proposing a multi-theoretical framework on service provision. In contrast to conventional outsourcing models, the service providers' perspective can be addressed most appropriately following multiple (sequential) theoretical assumptions.

Second, the proposed four archetypes and the developed service provision continuum complement traditional views on insourcing and outsourcing. The findings demonstrated that different archetypes of service provision represent overlapping boundaries in terms of their determining characteristics, such as resource allocation, risk propensity or service development, which cannot be altogether explained by a single theory. The findings suggest, for example, that firms within the boundaries of highly integrated service provision acquire standardised logistics assets. In addition, their aversion towards bearing risk is quite limited due to their unwillingness to share information. Such behaviour towards sharing information, however, is deemed a crucial factor in facilitating competitive advantage and overcoming risks associated with small numbers bargaining, in particular for providers offering rather basic services.

In sum, and with the aim to stimulate a deeper theoretical discussion, this thesis purports that agency plays a major role in determining service provision boundaries and in explaining the role of systems integration. However, for less integrated services or for standardised transactions or processes, the management of the material, information and financial flow across multiple supply chains seem to be their primary concerns. Hence, traditional views of insourcing and outsourcing would benefit from adopting the service provision continuum and acknowledging that there are overlaps within service boundaries. From a service providers' perspective, such contextualisation contributes to the better incorporation of theoretical assumptions, derived from other disciplines.

6.3.2 Addressing the Methodological Discussion on Case Research in OM

Given the dominance of quantitative studies in operations management research over past decades, this thesis promotes the application of a qualitative approach in the form of a multiple case study. Contrary to conventional case study research that aims to explore and establish theories following a purely inductive reasoning, this study outlines distinct research questions and clearly states the unit of analysis prior to conducting any empirical research and fieldwork. Such a rather deductive process, as is part of the overall abductive research approach, is usually conducted using statistical correlation analyses based on survey data. One could argue that due to the exploratory nature of case studies, its application to operations management research is limited due to the emphasis on building rather than testing theories. This study overcomes this pitfall by iteratively switching between data and theory in order to test the applicability of pre-established theories to the phenomenon of service provision, but also to explore and develop a deeper understanding of systems integration. Therefore, this thesis raises the following two discussion points, which pertain to its methodological advancements.

First, the general case study design was re-evaluated and employed as a more dynamic and flexible research approach that was not limited to inductive and interpretivistic reasoning. Case studies and qualitative data can contribute to the elaboration of existing theories (deduction), while simultaneously explaining a phenomenon and contributing to the development of new theories (induction). Spring and Santos (2015), just recently, challenged the traditional approach of institutionalising case study research in OM. They suggest that cases *per se* should not serve as initial input, but rather represent the output of the research process. Following their argument, this thesis also does not purposely

define and select distinct cases *a priori* but develops archetypes of case firms that demonstrate similar behaviour. Furthermore, and following the above contribution of using a multi-theoretical perspective, the developed archetypes are not forced by a single theory (no matter whether it is RBV, TC or AT) to shift, as Spring and Santos (2015) describe it, from case to dyad or to transaction, for instance. Hence, the rigour and in-depth investigation of the actual case (i.e. archetypes) better represents the phenomenon, which remains that of service provision and systems integration.

Second, and focusing on the intra and inter textual analysis (i.e. within-case analysis and cross comparison of the findings), operations management research does not only lend itself to hard and measurable data, but also invites exploratory research that incorporates interpretive analysis. For example, developing an understanding of relationships between organisations and individuals requires an observer to be an integral part of the study and gain insight through participation.

In sum, this thesis applies an abductive approach to operations management research that incorporates both theory testing (deductive) and theory building (inductive). Such an approach could contribute to methodological advancement in case study research. In addition, it is argued here that the managerial relevance of operations management research is maintained by applying qualitative methods (MacCarthy et al. 2013).

6.3.3 Addressing the Managerial Discussion on the Providers' Perspective

Referring to the managerial implications within the fields of operations and supply chain management research, studies traditionally focus on the development of models in the form of simulations, scenario planning and correlation analyses, as they pertain to decision makers. Hence, their application tends to be more pragmatic than theoretical or exploratory. While this thesis tends toward the latter, the question remains as to how managers or decision makers, who execute strategic, tactical and operational functions within any organisation or firm, can benefit from this research. The developed continuum of service provision thus results in three main practical implications that represent the managerial contribution of this thesis.

First, the presented study does not generalise and therefore demonstrates that the applicability of a single, universal model for outsourcing decisions and service provision is obsolete. Managers can choose from a multiplicity of outsourcing and strategic

management tools that are known to practitioners, all of which only address a unique and specific concern of business strategies. However, within the particular context of identifying different archetypes of service provision, the findings of this thesis highlight the importance of inter- and intra-organisational dynamics that need to be addressed (and understood) carefully in any buyer-supplier relationship. Within the growing interest in information availability and downstream customer adaptation, large-scale service providers, such as Uber, Facebook or Amazon increasingly require sophisticated and enhanced logistics solutions. In particular, providers of integrated and adapted services will better meet these customers' requirements as they understand how to acquire and exploit capabilities from sub-tier services or provider firms.

Second, in order to maintain successful outsourcing relationships, managers and decision makers (from focal firms) should not only focus on cost-driven business models or traditional cost trade-offs with a pure focus on price. In fact, raising awareness of how assumptions of bounded rationality and information asymmetry affect every component within a system, and in particular a logistics system, ultimately increases the chances of more satisfactory outsourcing relationships and operational performance results. Hence, from the service providers' perspective, barriers like goal incongruences and information asymmetry can be addressed mutually, which will result in the provision of superior performance.

Third, if decision makers understand the role and nature of systems integrators in service provision, this will ultimately lead to the better employment of such provider firms' capabilities. Referring to the distinctions of market, hybrid and hierarchical governance forms, logistics managers can now adapt their outsourcing relationships to a specific business situation, which may change depending on supply and demand, the customer base, the production processes or the underlying distribution structure. Such shifts in governance structures, however, are not supported by quantitative analyses in this thesis, but rather by holistic evaluations of the supply chain wide structures.

In sum, the proposed service provision continuum in this thesis contributes to the understanding of service boundaries from a practical standpoint. Furthermore, the definition of these boundaries enables us to explain the future development of large-scale service providers, and in particular, those providers adopting the role of supply chain wide systems integration.

CHAPTER SEVEN:

CONCLUSION AND FUTURE OUTLOOK

The purpose of this chapter is to summarise the key findings and contributions of this thesis, as well as suggest avenues for future research. Section 7.1 offers a summary of the multiple case study and presents a comprehensive discussion on the key outcomes. Section 7.2 acknowledges the main limitations and generalisability issues inherent in a qualitative case study design. The theoretical, methodological and managerial contributions are summarised in sections 7.3, 7.4 and 7.5, respectively. This chapter concludes with a presentation of avenues for future research in section 7.6.

7.1 Conclusion and Final Remarks

The key findings and contribution to theory, methodology and practice are summarised in the following Table 7.1.

	Contribution	Evidence
<i>Theoretical</i>	Elaboration of RBV to become a more dynamic tool in the form of explaining different archetypes of service provision	Case study shows that there are dynamics within similar firms regarding the exploitation of tangible and intangible resources
	Elaboration of TCE to go beyond simple insourcing and outsourcing issues and explain service provision continuum	
	Elaboration of AT to become more applicable to a business and operations context in organising systems integration	
<i>Methodological</i>	Responding to the need for more case study research in operations management	Systematic review of the literature warrants this method
	Development of a qualitative abductive case study approach	Theoretical constructs were tested based on qualitative interview data
<i>Managerial</i>	Decision making factors regarding the selection of service providers	Within case analysis of four archetypes of service provision
	Deeper understanding of systems integration	Cross comparison of archetypes shows that there is a distinction between service capabilities amongst firms

Table 7.1: Summary of Contributions of this Thesis

This thesis approached the outsourcing and insourcing discussion and the understanding of systems integration issues from both a theoretical and empirical perspective. In this

way, a multitude of theories that conventionally, albeit individually, explain the phenomenon of service outsourcing were combined into a multi-theoretical initial framework (see Figure 2.13), which has been applied to empirical data about the service industry. The need for a systems integration role has also been justified based on the empirical findings that relate to the integration capabilities of different archetypes of service provision. Methodologically, this thesis contributes to the knowledge development in the academic fields of operations and supply chain management, by applying a case study design based on an abductive approach (i.e. iteration between data and theory) and qualitative data analysis. Substantively, this thesis contributes to the understanding of the capabilities and adaptability of different archetypes of service provision. In conclusion, the empirical data demonstrates that there does not exist a clear distinction between archetypes of service provision. In response, a continuum was evidenced amongst provider firms within the logistics industry that should be addressed when making strategic decisions about the boundaries of the firm, from a service providers' perspective.

7.2 Generalisability and Limitations of the Research

A primary tenet in management disciplines pertains to the degree of generalisability of empirical research. Most studies, particularly those that are quantitative in nature and are common in the fields of operations research and decision sciences, aim to generalise findings in order to best reflect and predict the behaviour of an entire population that represents a certain phenomenon. This entails extensive processes to ensure the reliability, validity and credibility of a study's sample, such as confirming that a sample size is statistically significant. Qualitative research, however, does not employ statistical means to measure or justify the level of significance in case sampling. Rather, qualitative case study research acknowledges that all cases within a sample demonstrate unique characteristics and, due to the complexity of interactions in social phenomena, recognises that calibrating representative cases can be difficult. The results of this study are thus not generalisable. While this implies certain limitations, it can also serve as a point of departure for future research; the limitations are discussed below.

First, the unit of analysis in this thesis does not represent a single dependent variable and therefore this study does not answer or solve a specific pre-formulated problem. The exploratory nature of this study, however, overcomes this potential lack of analytical

reasoning by contributing to the understanding of a phenomenon in a wider operations management context.

Second, the data collection process in this study was restricted due to the availability of, and access to, participants and case firms. In addition, the rather small number of interviewees per case further limits generalisability. However, having investigated a relatively large number of case firms contributed to a higher degree of data saturation, as findings from multiple firms were compared (i.e. multiple sources of evidence).

Third, the presented multiple case study is static in nature and its findings do not consider dynamics in the form of changing behaviour as they might occur over time (i.e. longitudinally). Due to the limited number of interviewees per case firms, temporal changes regarding the phenomenon of service provision boundaries could not be reported or investigated. However, this study provides insight into issues arising between case firms (in the form of service provision archetypes) and therefore contributes to a deeper understanding of inter-organisational dynamics. Hence, the time dimension is not a necessary requirement to discuss integrator roles or the boundaries of service provision. In addition, future research is needed in the form of further case studies in order to compare the results from different contexts (Lewis 1998).

As the three limitations above illustrate, drawing general conclusions from qualitative case studies is largely restricted given the limited number of cases and interviewees. Thus, this study does not necessarily aim to generalise its findings to a wider or broader population, rather it contributes by contextualising and theorising the initial conceptual framework. In sum, the limitations regarding the (1) unit of analysis, the (2) case selection and sampling processes, as well as the (3) static nature of the study can be addressed in future studies, as is further discussed in Section 7.6.

7.3 Theoretical Contribution

Theoretically, this study contributes by elaborating on existing theories from other disciplines within the domain of operations management and in the context of service provision and the logistics industry. The purpose of conducting this empirical research was to pragmatically assess the interested economic and sociological theories by discussing their applicability to the case study data and the phenomenon of interest. Hence, the theoretical contribution is implied via the contextualisation of the theoretical

constructs: RBV, TCE, AT and SI. Furthermore, the initial conceptual framework proposed in this thesis contributes to relevant discussions about the role of systems integrators and their respective boundaries of service provision. This approach shows what part of a service provision continuum (i.e. what archetypes) can be explained best and most accurately by what theories.

Concluding, the initial conceptual framework proposes that (1) RBV assumptions regarding tangible resources best describe the behaviour of LSC firms; (2) TCE assumptions regarding frequency and uncertainty best describe the behaviour of LSP (out) firms; (3) AT assumptions regarding overcoming goal incongruences best describe the behaviour of LSP (inst) firms; and (4) SI assumptions regarding the interaction with downstream customers and end-consumers best describe the behaviour of LSI firms.

7.3.1 Elaboration of the Resource-Based View for Service Provision Boundaries

The findings from the within-case analysis conclude that the RBV of the firm is primarily applicable to explaining the competitive status of LSC firms, focusing on strategic capabilities, such as the exploitation of tangible resources. The cross comparison amongst the four archetypes of service provision supports these findings. Moreover, this study also contributes to extending RBV. Empirically, this research suggests that the RBV framework (referring explicitly to Barney's VRIO test) cannot be uniformly applied to any type of firm within a particular industry. Hence, the VRIO model is challenged and not entirely supported in the form that, and because resources are mostly idiosyncratic, they can be acquired and accessed quite easily from integrator firms, for instance. This results in the bundled provision of products and services and contradicts to the RBV assumption that resource heterogeneity cannot easily be challenged. The findings also propose that some firms emphasise different types of capabilities, which they then, in turn, can bundle and combine with regard to their service provision boundaries. Drawing on the limitations and critiques of RBV as a rather static method to determining competitive advantages, this study shows that the focus and importance of capabilities vary, depending on the level of supply chain integration. This clearly highlights the potential for a more dynamic application of RBV and the following three implications.

First, within the context of logistics services, physical assets do not support a sustained competitive advantage, even though they might be scarce and inimitable. The evidenced

acquisition of capabilities that is due to highly competitive environment does reduce the inimitability of scarce resources.

Second, the acquisition of scarce resources can only be achieved successfully, if the provider firms represent an advanced organisational structure and the firm emphasises on maintaining and establishing collaborative (long-term) relationships. Short-time access to physical assets, such as distribution networks or warehousing facilities does not corroborate with a competitive advantage. Hence, resources, even if they are scarce and inimitable, can be acquired short-term, but the exploitation requires their implementation into the organisational structures.

Third, knowledge and know-how, as it is evidenced amongst firms within the archetype of LSC service provision, does not need to be developed actively because these intangible capabilities are already a result of the competitive nature of the logistics industry. However, for the highest form of integrator firms (LSI firms), enhanced knowledge and customer expertise cannot be acquired externally but needs to be developed internally; thus, through downstream interaction with the end-consumer.

7.3.2 Elaboration of Transaction Cost Economics for Service Provision Boundaries

Drawing on the criticisms of TCE that highlight the fact its applicability is limited to abstract theorisations, this study suggests that TCE can be incorporated within a contextualised definition of service provision boundaries. In particular, TCE assumptions regarding asset specificity and opportunistic behaviour hold true for rather basic and standardised services, as they are present within the archetype of LSC service provision. Not surprisingly, and that is how this thesis supports the application of TCE to service boundaries, these basic logistics operations follow very closely market transactions in the form of 'arms'-length' relationships. From the service providers' perspective, therefore, the results imply the following three contributions.

First, within the context of logistics services, asset specificity is employed differently amongst the four proposed archetypes of service provision. Less integrated service providers bear the financial risks of achieving a proper return on investment, whereas highly integrated providers or systems integrators do not face such risks because they acquire the assets through market transactions.

Second and referring to uncertainty and frequency of transactions, this thesis support the theoretical assumptions of TCE, insofar as transactions are governed via the market when uncertainty is high and hierarchically when uncertainty is low.

Third, the assumptions of employing small numbers bargaining cannot be fully supported, insofar as highly integrated provider firms still face risks associated with switching and monitoring suppliers, even though the alternative options are limited. Hence, the leveraging power of providing integrated services still favours sub-tier providers. This also refers to the highly competitive business environment amongst all archetypes of service provision.

7.3.3 Elaboration of Agency Theory for Service Provision Boundaries

Drawing on the sociological origins of AT and claims of its limited applicability to organisations and operations management, this thesis proposes that contractual and relational issues impact the behaviour of firms, in terms of defining their service boundaries. Hence, the findings result in the following four implications.

First, the case study analysis shows that highly integrated service providers (i.e. those who focus on customer interaction and downstream integration) do not require as much information about their sub-tier providers' capabilities and emphasis is placed on basic product-related information (i.e. tracking and tracing). The findings suggest that information asymmetry is only important on a product-level and not on a firm-level. Thus, the integrator firms pay little attention to what the upstream provider actually offers but are rather concerned about the visibility of the processes. Hence, adverse selection can be neglected for highly integrated services.

Second, and in line with the above, monitoring efforts for highly integrated services are limited to basic and standardised performance objectives and also highly focused on product-related information. Therefore, it is not necessary to measure sub-tier providers' performance but rather focus on basic statistics and descriptive data evaluation. Hence, systems integrators can mitigate the costs associated with moral hazard.

Third, the findings suggest that established service providers, such as LSP (out) and LSP (inst) firms demonstrate no particular efforts in aligning goals and information with their downstream customers. Referring to the above second point, a strategic alignment of firm specific goals is not evidenced but rather information asymmetry on a product and service

level are emphasised. Hence, the assumption of information asymmetry from AT holds true for increasing operations visibility across all archetypes of service provision, but goals are rarely aligned in the logistics industry.

Fourth, referring to goal incongruences, the findings suggest that there is a high risk of opportunistic and self-interested behaviour amongst all archetypes of service provision. In a similar vein to the rather tactic and operational monitoring and information alignment, the service providers demonstrate no evidence where they do not act opportunistically. Hence, AT assumptions about mitigating goal incongruences with proper contractual or relational arrangements cannot be supported in the context of logistics service provision.

7.3.4 Elaboration of Systems Integration for Service Provision Boundaries

This thesis overcomes significant barriers regarding the underexplored phenomenon of systems integration and the provision of PSS within the context of logistics systems. The findings suggest – and therefore support Davies et al.'s (2004) argument regarding the shift towards downstream integration – that the concept of SI can be transferred from large-scale industries to the provision of services and explain the boundaries of service provision. Hence, this thesis argues the following three implications.

First, referring to the ability of market adaptation, this thesis suggests that less integrated service providers (i.e. LSC and sometimes LSP (out) firms) can better align their services to customer requirements than can highly integrated LSI firms. This is evident based on their less hierarchical structure and the fact that customer requirements actually rely on basic objectives related to on-time delivery or efficient material handling. These operational activities are not directly controlled by LSI firms and therefore favour the sub-tier providers of services.

Second, referring to the ability to develop products, service and systems, the providers' perspective in this thesis suggests that firms that have a direct link to enhanced products and physical networks, such as in the case for LSP (out) firms mostly achieve such integration capabilities. Even though LSI firms, for instance, provide highest form of end-consumer interaction, the actual development and provision of enhanced services needs to be acquired from sub-tier providers.

Third, and referring to the previous implication of the findings from the providers' perspective, customer and end-consumer interaction is equally important for all archetypes of service provision. Hence, the findings suggest that there is not a significant difference in the degree of customer interaction for less versus highly integrated services, as the buying firm (not the end consumer, but the downstream retail, manufacturing or service customer) primarily drives customer interaction, and service providers solely adapt to the changing requirements.

7.4 Methodological Contribution

Three central takeaways and contributions have been realised from implementing this multiple case study design. First, case study research is a useful and applicable method to conduct exploratory research in the field of operations and supply chain management. Second, case study research requires a strict, yet flexible protocol that allows the researcher to go back and forth between the findings of the collected data and the assumptions or theoretical constructs derived from the literature and theory. Therefore, case study research lends itself quite appropriately to an abductive research approach. Third, this study suggests that qualitative data collection and analysis methods are appropriate to deductively (within a wider abductive approach) assess and test theoretical constructs. These three contributions are described below.

Referring to the application of case study research in the field of operations management, this thesis proposes that a multiple case study design is advantageous to investigate the phenomenon of service provision and systems integration insofar as it facilitates the evaluation of a broad range of firms within a specific context.

Referring to the adoption of an abductive approach in case study research, this thesis suggests that neither purely inductive nor purely deductive reasoning can capture the deep insights that case findings offer.

Referring to the use of interviews as a means of data collection in case study research, this thesis suggests that following a strict interview protocol allows for the elaboration of multiple theories by interpreting and analysing the collected interview data and observations iteratively. Therefore, the theories do not predominantly define the unit of analysis or the central interested phenomenon and the researcher has more control in independently designing and structuring the case study research.

7.5 Managerial Implications

The leading contribution of this thesis, from the service providers' perspective, is that it brings together the practices of outsourcing and systems integration. In doing so, this thesis goes beyond the view of investigating conventional insourcing and outsourcing decisions by the focal firm, in order to shed insight into the optimal role(s) of solution service providers, i.e. systems integrators.

In order to categorise service requirements, it is first important to understand that there exist different archetypes of service provision, each with unique, but overlapping, characteristics. That being said, it is also important to acknowledge that there are no clear boundaries between offered services and the level of integration provided by the service firms. This transparency increases the likelihood of a better collaborative arrangement and relationship. Suffice to say, an integrator firm can only increase its network performance and the value of a customer relationship, if some customer interaction and end-consumer adaptation is implied, such as in the high-tech or fashion industries. Alternatively, service integration in industries like manufacturing and B2B production industries of capital goods, does not focus on the establishment of a means of communication, but rather on the provision of equipment and standard services. Thus, three managerial contributions are summarised below.

First, referring to industry trends, this thesis suggests that the emerging role of systems integrators is very much present in the logistics industry. However, the frequently cited definition offered for integrated service providers like 4PL firms is not supported, as there are no clear boundaries as to what 4PL services include and the concept remains rather vague and unclear. Hence, this research proposes a continuum of service provision that allows most service firms (not for basic and standardised services) to gain control over their integration responsibilities or at least part of them.

Second, referring to the benefits of service providers, this thesis proposes that firms must properly align their business units and strategic service offerings to the context of their wider archetype. Hence, despite the development of a continuum, the pure provision of products and/or services does not contribute to the overall competitive advantage of a service firm. It is critical that each firm understands the boundaries of their target services, which subsequently empowers them to address the appropriate managerial steps, such as selecting the right governance structure, from the service providers' perspective.

Third, referring to the implications on decision-making, this thesis proposes that providers must develop an understanding of their specific capabilities that, in turn, translate into market, hybrid or hierarchal forms of governance. Regarding the developed service provision continuum, provider firms can benefit by offering a clear agenda of services offered to their customers, which subsequently increases customer satisfaction. For LSC firms, the focus must be on the exploitation of physical assets in order to overcome the threats of adverse selection. LSP (out) firms must focus on their relational capabilities to better benefit from economies of scale. LSP (inst) firms must emphasise their organisational capabilities by properly aligning customer goals with operational procedures in order to increase return on capital investment. LSI firms must develop their industry knowledge in order to improve their orchestrator role that includes the delegation of operational tasks.

7.6 Avenues for Future Research

The presented research study has explored various important issues in the field of operations management, such as explicating the role of systems integration, defining the service provision boundaries and developing a continuum of service provision. The findings are concise and specific to the investigated context, but they also indicate some potential avenues for future research in the academic field of operations and supply management research. Future work is suggested based on the four following themes: (1) Testing the theories using alternative research methods; (2) applying a wider scope to service provision that goes beyond the logistics functions; (3) implementing a dynamic and longitudinal approach; and (4) focusing on a relational dyadic context.

Using Alternative Research Methods to Test the developed Propositions

Drawing on the abductive research approach of this thesis, which entailed the development of an initial conceptual framework, future studies should investigate the suitability and validity of the proposed model. This would require that the theoretical constructs be operationalised by additional empirical data in order to ensure statistical significance. In this regard, the developed model proposed in this research should be tested with quantitative data from surveys and/or questionnaires. Given that the model incorporates more than one theoretical construct, the first step to operationalising the conceptual framework would be to divide it into its separate parts, focusing on one theoretical contribution at a time. This would allow future studies to test the applicability

of constructs from RBV, TCE, AT and SI separately, which would correspondingly narrow the theoretical contribution and therefore increase the model's focus on a context.

Studies on RBV could focus on the specific resources a service provider might exploit and investigate the impact that these resources could have on performance objectives within a supply chain or network, on across multiple partners. Notably, some work has already been undertaken in this area by Karia and Wong (2013) and Poppo and Zenger (1998), who emphasise the value of RBV assumptions within the logistics industry.

Studies on TCE could emphasise the impact that specific assets and related investments have on a firm's willingness to bear risks in order to reduce costs by applying a market, hybrid or hierarchical governance form. This thesis, however, acknowledges previous work by Logan (2000) and Manuj and Mentzer (2008), for example, that highlight the phenomenon of governing logistics transactions with regard to the inter-organisational relationship in service supply chains.

Studies on AT could focus on how providers and buyers of services are willing to share information and to what extent such behaviour results in the availability of information that ultimately reduces financial and operational risk. Zsidisin and Ellram (2003) and Tate et al. (2010) have already begun to investigate the principal-agent problem in a supply chain and logistics context. Hence, a clearer view on the application of TCE on the provision of services, in particular, from the provider firms' perspective is suggested.

This particular study focused on a multi-theoretical contribution by elaborating on existing theories, but also by proposing a novel combination of concepts in a contextualised framework. Thus, future research on service provision and systems integration can also expand on the theoretical perspective by proposing relevant theories that were not included in this study. Such an approach could further increase insight into supply chain and supply network wide interactions that inform the phenomenon of supply chain complexity, including both providers and buyers of logistics services.

Extending the Scale and Scope of the Research Context

The presented research was primarily based on firms within Europe and proposed a conceptualisation on national/European capabilities and service boundaries. Thus, future studies could conduct similar research across international contexts, such as in North America, Australia and Asia, for example, which would increase the knowledge

surrounding service boundaries on a larger scale. Additionally, such a global comparison would ultimately contribute to the degree of generalisability of the conceptual framework offered in this thesis. Furthermore, extending the scale of the investigated case firms would also shed light on the relevance of the external environment, such as legal regulations, consumer behaviour and specific customer requirements within different industries. Hence, the focus of future studies could consider the impact of country or industry specific customer requirements on the provision of services. On a similar note, future research could go beyond the context of logistics services to investigate other industries that are subject to outsourcing activities, such as maintenance, production of spare parts and equipment, facility management and human resources. Consequently, these study findings could be compared with the findings in this thesis to increase the generalisability of the contextualised framework.

Applying a more Dynamic and Longitudinal Approach

Given the static nature and narrative approach adopted in this thesis, it would be useful to extend future studies longitudinally. Hence, a longitudinal study would illustrate how firms change over time and could also contribute to the validity and durability of the firm archetypes. Additionally, such a study could underline the differences, commonalities and idiosyncrasies within and across each firm archetype. Ultimately, a longitudinal focus would verify the existence of a service provision continuum that can withstand the test of time and adapt to changing market situations. Adapting the current continuum to the dynamic market in terms of customer requirements, manufacturing efficiency, reliable delivery and return operations, for example, would further increase the current understanding of systems integrators in logistics systems.

Focusing on Relational and Dyadic Supply Chain Issues

Referring to the extant research in supply chain and operations management, the pure provider perspective adopted in this thesis could be extended to further investigate dyadic (or even triadic) contractual and relational arrangements within supply chains or supply networks. Assuming that supply chains or networks consist of multiple players and given the fact that a triadic relationship is viewed as the smallest unit within any network, future research could go beyond the buyer-provider link and further investigate the numerous dynamics between and within multiple firms. Hence, data must be collected from buyers of services and also from other external stakeholders, such as manufacturers or retailers.

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APPENDIX A

PUBLISHED RESEARCH OUTPUT

The following publications, amongst others, are a result of the research process and represent selected parts of the theoretical and empirical findings of this thesis.

Refereed Conference Proceedings

- König, C., Caldwell, N.D. and Rutherford, C. (2015) 'Moving towards integrated solutions in logistics systems – Empirical evidence across service supply chains', *Proceedings of the 20th ISL Conference*, Bologna, Italy, Jul 5-8.
- König, C. and Caldwell, N.D. (2015) 'Relational governance in outsourcing relationships – The integrated role of service providers', *Proceedings of the 22nd EurOMA Conference*, Neuchatel, Switzerland, Jun 28-30.
- König, C. and Caldwell, N.D. (2015) 'Different types of service provision – Governing mechanisms in outsourcing relationships', *Proceedings of the 24th IPSERA Conference*, Amsterdam, Netherlands, Mar 29-31.
- König, C. and Caldwell, N.D. (2014) 'The governance of logistics services – Evidence from case studies', *Proceedings of the 19th LRN Conference*, Huddersfield, UK, Sep 3-5.
- König, C. and Caldwell, N.D. (2014) 'Systems integration or conventional outsourcing – A conceptual framework', *Proceedings of the 21st EurOMA Conference*, Palermo, Italy, Jun 20-25.
- König, C., Caldwell, N.D. and Rutherford, C. (2014) 'The role of systems integrators in strategic outsourcing relationships', *Proceedings of the 23rd IPSERA Conference*, Pretoria, South Africa, Apr 13-16.
- König, C., Caldwell, N.D. and Hermann, U. (2013) 'Designing transportation networks – An investigation in the European food logistics industry', *Proceedings of the 18th LRN Conference*, Birmingham, UK, Sep 4-6.

Published Book Chapters

- Rutherford, C. and König, C. (2015) 'Logistics and the supply chain', in: Arshed, N. and McFarlane, J. (eds.), *Enterprise and its Business Environment*, Oxford: Goodfellow Publishers Ltd. [Forthcoming]

Case Studies

- König, C. and Caldwell, N.D. (2015) 'Growth strategies of logistics service providers - An RBV perspective on the logistics industry', *Online Teaching Case Study*, London: Kogan Page. [Forthcoming]

APPENDIX B

SEMI-STRUCTURED INTERVIEW GUIDE

The following interview questions represent a guide to the technique of a semi-structured interview that is chosen to be the data collection method for the research. The interview guide ensures consistency and validity across the investigated interviewees and cases.

The position and name of the interviewee will be recorded, but confidentiality should be respected at all times.

Organisation:

Name:

Job title:

Contact details:

Date:

Place:

Recording time:

Part I: Interviewee Information and Company Background / Development

- What is your role and responsibility in the company?
- How did the company develop its current logistics capabilities?
- What is the current structure of your customer base, how has it changed?
- How did your actual logistics network develop?
- How did human capital and knowledge develop over time (acquisition)?
- What services do you offer to which customers?
- Which activities do you outsource, which do you govern internally?
- What form of relationship do you have with your customers / suppliers?

Part II: Resource-Based View – Capabilities, Core Competencies and Resources

- Which (tangible) resources / assets are owned by your organisation?
- How do you access and exploit other (necessary) resources?
- Why do you not acquire these resources (short-term, long-term)?

- What is your perspective on gaining a sustained competitive advantage by providing valuable, rare, inimitable and non-substitutable resources, and why?
- Which transactions require strategically important resources and capabilities?
- To what degree does *flexibility* affect your organisation's performance?
 - How flexible is your organisation (changes, customers, adaptation)?
 - How flexible are your subcontractors?
 - How do changing customer requirements affect your operations?
- To what degree do communication capabilities affect your performance?
 - How is information shared amongst partners?
 - How is communication/data exchange maintained (over time)?
 - How reliable is the data exchange (what technology)?
- How do physical resources affect your organisation's performance?
 - Who provides physical equipment and who makes the investments?
 - Who else can provide the equipment for certain activities? (rarity)
- How do technological resources affect your organisation's performance?
 - How are the technological resources acquired and maintained?
- How do human capabilities and skills affect your organisation's performance?
 - How is staff being trained?
 - How does your organisation maintain the skills of its employees?
 - How important are the skills and experience of your staff (monitoring)?
- How do organisational capabilities affect the organisation's performance?
 - How do you achieve customer satisfaction?
 - To what degree does your organisation focus on customer satisfaction?
 - How do you measure customer satisfaction?

Part III: Transaction Cost Economics – Uncertainty and Frequency

- What is the frequency of certain/particular logistics transactions?
- How are these transactions governed?
- What is the time dimension for particular transactions, projects, contracts?
- What investments are necessary for certain transactions?
- To what extent are other suppliers available for certain transactions?
- What is the nature of transaction costs for certain activities?
 - Which transactions have high or low transaction costs?
 - To what degree can your organisation be replaced (from client view)?

- How easily can you change your suppliers or subcontractors?
- How specific are transactions and assets tailored to your customers' needs?
- To what degree can future requirements be forecasted or anticipated?
 - ... customer requirements?
 - ... technological requirements?
 - ... share of outsourced activities?

Part IV: Systems Integration – Integration and Adaptation of Transactions

- To what degree does your organisation offer a bundle of services?
- Do customers choose individual services or does your organisation provide integrated solutions?
- To what degree do changing requirements (environment or customers) affect the provision of services?
 - Change in accessing and switching resources
 - Change in terms of increasing or decreasing uncertainty
- To what degree does increasing complexity affect the governance form for certain transactions?
- What form of contract do you use for highly complex (long-term) transactions (short-term contracts as well)?
- How many parties are involved in the most complex transactions/operations?
- Do contracts change due to the provision of complex solutions
 - Do they change over time?
- What type of contracts do you use in terms of outcome, behaviour, or performance base?

Part V: Additional Information and Questions

- Is there anything else you would like to add or clarify?
- Could you please point out any additional information or other organisation that would support my research project?

APPENDIX C

RECORD OF FIELD WORK

Interviewee	Date	Position	Service Firm
1	24/02/2014	Assistant to the Logistics Manager	1 LSP (out)
2	25/02/2014	Head of Logistics	2 LSP (inst)
3	25/02/2014	Managing Director	3 LSC
4	02/03/2014	Business Development	4 LSP (inst)
5	02/03/2014	Logistics Manager	5 LSP (inst)
6	03/03/2014	Head of European Network Development	6 LSP (out)
7	05/05/2014	Key Account Manager	7 LSP (out)
8	05/05/2014	Logistics Specialist Transport Management	8 LSP (inst)
9	06/05/2014	Head of CEP Services	9 LSI
10	21/05/2014	Assistant Transport Manager	10 LSC
11	25/05/2014	Assistant to the CEO	11 LSC
12	26/05/2014	Head of Logistics and Task Force Management	12 LSP (out)
13	26/05/2014	Solution Design Engineer – Transport	13 LSI
14	27/05/2014	Account Coordinator Business Development	14 LSI
15	28/05/2014	CEO	15 LSP (inst)
16	29/05/2014	Branch Management	16 LSC
17	29/05/2014	Group Manager Transport Logistics	17 LSP (inst)
18	11/06/2014	Logistics Controller	18 LSP (out)
19	12/06/2014	Manager Contract Logistics	19 LSP (inst)
20	16/06/2014	Assistant to the CEO	20 LSC
21	31/07/2014	CEO	21 LSC
22	31/07/2014	Sales Manager Freight	22 LSP (out)
23	02/09/2014	CEO	23 LSP (out)
24	24/09/2014	Stock Deployment Coordinator	24 LSP (inst)
25	03/11/2014	Account Director	25 LSP (out)
26	01/12/2014	CSO	16 LSC
27	05/12/2014	Project Manager	3 LSC
28	06/12/2014	Team leader European Network Development	6 LSP (out)
29	10/12/2014	Logistics Manager	20 LSC
30	15/12/2014	CEO	3 LSC

Table C.1: Record of Field Work

APPENDIX D

RESULTS FROM THE SYSTEMATIC LITERATURE REVIEW

	Customer	Focal Firm	Provider	Total
<i>Totals</i>	28 (24 %)	41 (34 %)	50 (42 %)	119 (100 %)
<i>2013</i>	2 (25 %)	2 (25 %)	4 (50 %)	8 (100 %)
<i>2012</i>	5 (28 %)	6 (33 %)	7 (39 %)	18 (100 %)
<i>2011</i>	4 (22 %)	6 (33 %)	8 (44 %)	18 (100 %)
<i>2010</i>	7 (35 %)	8 (40 %)	5 (25 %)	20 (100 %)
<i>2009</i>	2 (25 %)	2 (25 %)	4 (50 %)	8 (100 %)
<i>2008</i>	1 (8 %)	6 (46 %)	6 (46 %)	13 (100 %)
<i>2007</i>	2 (20 %)	3 (30 %)	5 (50 %)	10 (100 %)
<i>2006</i>	1 (10 %)	5 (50 %)	4 (40 %)	10 (100 %)
<i>2005</i>	1 (25 %)	2 (50 %)	1 (25 %)	4 (100 %)
<i>2004</i>	1 (25 %)	1 (25 %)	2 (50 %)	4 (100 %)
<i>2003</i>	2 (33 %)	0 (0 %)	4 (67 %)	6 (100 %)

Table D.1: Focus of Logistics Outsourcing Articles by Year, 2003-2013

	Customer	Focal Firm	Provider	Total
<i>Totals</i>	28 (24 %)	41 (34 %)	50 (42 %)	119 (100 %)
<i>EJOR</i>	0 (0 %)	6 (60 %)	4 (40 %)	10 (100 %)
<i>IEEE</i>	1 (100 %)	0 (0 %)	0 (0 %)	1 (100 %)
<i>IMM</i>	2 (25 %)	1 (13 %)	5 (63 %)	8 (100 %)
<i>INT</i>	1 (33 %)	0 (0 %)	2 (67 %)	3 (100 %)
<i>IJLM</i>	0 (0 %)	0 (0 %)	5 (100 %)	5 (100 %)
<i>IJOPM</i>	1 (14 %)	1 (14 %)	5 (71 %)	7 (100 %)
<i>IJPDLM</i>	5 (28 %)	7 (39 %)	6 (33 %)	18 (100 %)
<i>IJPE</i>	0 (0 %)	10 (48 %)	11 (52 %)	21 (100 %)
<i>IJPR</i>	2 (22 %)	4 (44 %)	3 (33 %)	9 (100 %)
<i>JBIM</i>	1 (50 %)	0 (0 %)	1 (50 %)	2 (100 %)
<i>JBL</i>	5 (45 %)	2 (18 %)	4 (36 %)	11 (100 %)
<i>JOM</i>	1 (100 %)	0 (0 %)	0 (0 %)	1 (100 %)
<i>JPSM</i>	3 (60 %)	2 (40 %)	0 (0 %)	5 (100 %)
<i>JSCM</i>	3 (50 %)	1 (17 %)	2 (33 %)	6 (100 %)
<i>JORS</i>	1 (50 %)	1 (50 %)	0 (0 %)	2 (100 %)
<i>Omega</i>	0 (0 %)	3 (75 %)	1 (25 %)	4 (100 %)
<i>SCMIJ</i>	2 (33 %)	3 (50 %)	1 (17 %)	6 (100 %)

Table D.2: Focus of Logistics Outsourcing Articles by Journal, 2003-2013

	Total	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total	119 (100 %)	6 (100 %)	4 (100 %)	4 (100 %)	10 (100 %)	10 (100 %)	13 (100 %)	8 (100 %)	20 (100 %)	18 (100 %)	18 (100 %)	8 (100 %)
<i>Empirical</i>	94 (79 %)	2 (33 %)	3 (75 %)	2 (50 %)	7 (70 %)	8 (80 %)	10 (77 %)	6 (75 %)	20 (100 %)	13 (72 %)	16 (89 %)	7 (88 %)
<i>Theoretical</i>	4 (21 %)	6 (67 %)	8 (25 %)	18 (50 %)	4 (30 %)	6 (20 %)	8 (23 %)	18 (25 %)	4 (0 %)	6 (28 %)	8 (11 %)	18 (13 %)
Total	94 (100 %)	2 (100 %)	3 (100 %)	2 (100 %)	7 (100 %)	8 (100 %)	10 (100 %)	6 (100 %)	20 (100 %)	13 (100 %)	16 (100 %)	7 (100 %)
<i>Empirical</i>												
<i>Qualitative</i>	19 (20 %)	1 (50 %)	0 (0 %)	0 (0 %)	1 (14 %)	2 (25 %)	1 (10 %)	1 (17 %)	3 (15 %)	3 (23 %)	5 (31 %)	2 (29 %)
<i>Quantitative</i>	75 (80 %)	1 (50 %)	3 (100 %)	2 (100 %)	6 (86 %)	6 (75 %)	9 (90 %)	5 (83 %)	17 (85 %)	10 (77 %)	11 (69 %)	5 (71 %)
Total	25 (100 %)	4 (100 %)	1 (100 %)	2 (100 %)	3 (100 %)	2 (100 %)	3 (100 %)	2 (100 %)	0 (100 %)	5 (100 %)	2 (100 %)	1 (100 %)
<i>Theoretical</i>												
<i>Descriptive</i>	4 (16 %)	0 (0 %)	0 (0 %)	0 (0 %)	0 (0 %)	1 (50 %)	1 (33 %)	1 (50 %)	0 (0 %)	1 (20 %)	0 (0 %)	0 (0 %)
<i>Normative</i>	2 (84 %)	4 (100 %)	1 (100 %)	2 (100 %)	3 (100 %)	1 (50 %)	2 (67 %)	1 (50 %)	0 (0 %)	4 (100 %)	2 (100 %)	1 (100 %)

Table D.3: Orientation of Logistics Outsourcing Articles by Year, 2003-2013

	Total	EJOR	IMM	INT	IJLM	IJOPM	IJPDLM	IJPE	IJPR	JBL	JPSM	JSCM	Omega	SCMIJ
Total	119	10	8	3	5	7	18	21	9	11	5	6	4	6
	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)
<i>Empirical</i>	94	9	6	3	3	6	14	18	8	9	4	6	0	4
	(79 %)	(90 %)	(75 %)	(100 %)	(60 %)	(86 %)	(78 %)	(86 %)	(89 %)	(82 %)	(80 %)	(100 %)	(0 %)	(67 %)
<i>Theoretical</i>	25	1	2	0	2	1	4	3	1	2	4	0	4	2
	(21 %)	(10 %)	(25 %)	(0 %)	(40 %)	(14 %)	(22 %)	(14 %)	(44 %)	(18 %)	(20 %)	(0 %)	(100 %)	(33 %)
Total	94	9	6	3	3	6	14	18	8	9	4	6	0	4
Empirical	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)
<i>Qualitative</i>	19	0	1	0	1	1	5	4	3	0	2	0	0	2
	(20 %)	(0 %)	(17 %)	(0 %)	(33 %)	(17 %)	(36 %)	(22 %)	(38 %)	(0 %)	(50 %)	(0 %)	(0 %)	(50 %)
<i>Quantitative</i>	75	9	5	3	2	5	9	14	5	9	2	6	0	2
	(80 %)	(100 %)	(83 %)	(100 %)	(67 %)	(83 %)	(64 %)	(78 %)	(63 %)	(100 %)	(50 %)	(100 %)	(0 %)	(20 %)
Total	25	1	2	0	2	1	4	3	1	2	1	0	4	2
Theoretical	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)
<i>Descriptive</i>	4	0	1	0	1	0	1	1	0	0	0	0	0	0
	(16 %)	(0 %)	(50 %)	(0 %)	(50 %)	(0 %)	(25 %)	(33 %)	(0 %)	(0 %)	(0 %)	(0 %)	(0 %)	(0 %)
<i>Normative</i>	21	1	1	0	1	1	3	2	1	2	1	0	4	2
	(84 %)	(100 %)	(50 %)	(0 %)	(50 %)	(100 %)	(75 %)	(67 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)	(100 %)

Table D.4: Orientation of Logistics Outsourcing Articles by Journal, 2003-2013

* Journals that published less than five articles between 2003 and 2013 (i.e. IEE, IJLM, JOM and JORS) were excluded, for formatting reasons.

	Total	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Grand Total	119/15,301 (1 %)	6/917 (<1 %)	4/976 (<1 %)	4/962 (<1 %)	10/1,074 (1 %)	10/1,153 (<1 %)	13/1,367 (1 %)	8/1,362 (1 %)	20/1,489 (1 %)	18/1,814 (1 %)	18/2,138 (1 %)	8/2,049 (<1 %)
<i>IMM</i>	8/1,045 (1 %)	1/61 (2 %)	0/72 (0 %)	0/71 (0 %)	0/82 (0 %)	2/91 (2 %)	1/79 (1 %)	2/93 (2 %)	2/133 (2 %)	0/125 (0 %)	0/117 (0 %)	0/121 (0 %)
<i>IJLM</i>	5/199 (3 %)	1/16 (6 %)	0/15 (0 %)	0/15 (0 %)	1/13 (8 %)	1/21 (5 %)	0/19 (0 %)	0/22 (0 %)	1/22 (5 %)	0/19 (0 %)	1/18 (6 %)	0/19 (0 %)
<i>IJOPM</i>	7/602 (1 %)	0/68 (0 %)	1/61 (2 %)	1/64 (2 %)	1/59 (2 %)	1/57 (2 %)	2/49 (4 %)	0/42 (0 %)	1/46 (2 %)	0/40 (0 %)	0/61 (0 %)	0/55 (0 %)
<i>IJPDLM</i>	18/447 (4 %)	1/41 (2 %)	1/35 (3 %)	1/40 (3 %)	4/43 (9 %)	0/41 (0 %)	1/41 (2 %)	1/40 (3 %)	2/39 (5 %)	4/42 (10 %)	2/41 (5 %)	1/44 (2 %)
<i>JBL</i>	11/243 (5 %)	0/20 (0 %)	0/18 (0 %)	0/19 (0 %)	0/16 (0 %)	0/16 (0 %)	2/26 (8 %)	1/25 (4 %)	3/29 (10 %)	2/27 (7 %)	2/22 (9 %)	1/25 (4 %)
<i>JPSM</i>	5/285 (2 %)	1/24 (4 %)	0/22 (0 %)	0/21 (0 %)	0/25 (0 %)	0/20 (0 %)	0/22 (0 %)	0/33 (0 %)	1/34 (0 %)	1/26 (0 %)	1/28 (4 %)	1/30 (3 %)
<i>JSCM</i>	4/699 (1 %)	1/42 (2 %)	0/41 (0 %)	0/44 (0 %)	0/49 (0 %)	1/59 (2 %)	0/84 (0 %)	0/92 (0 %)	0/49 (0 %)	1/68 (1 %)	0/84 (0 %)	1/87 (1 %)
<i>JORS</i>	2/1,617 (<1 %)	0/121 (0 %)	0/121 (0 %)	0/134 (0 %)	1/133 (1 %)	0/151 (0 %)	0/151 (0 %)	0/170 (0 %)	1/160 (1 %)	0/178 (0 %)	0/145 (0 %)	0/153 (0 %)
<i>Omega</i>	4/297 (1 %)	1/12 (8 %)	0/16 (0 %)	0/15 (0 %)	0/14 (0 %)	1/20 (5 %)	0/36 (0 %)	0/34 (0 %)	0/33 (0 %)	1/37 (3 %)	0/39 (0 %)	1/41 (2 %)

Table D.5: Frequency of Logistics Outsourcing Articles by year, 2003-2013

* Note that *IEEE*, *INT*, *IJPE*, *JBIM*, *JOM*, *SCMIJ*, *EJOR* and *IJPR* were not considered, however, the total count refers to all 16 journals.

	Total	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<i>Logistics and Supply Chain Journals (9)</i>	478	0	17	14	20	34	25	29	44	87	116	92
<i>General Management Journals (5)</i>	43	0	0	0	3	4	7	3	4	2	12	8
<i>Operations Management Journals (5)</i>	284	1	6	2	13	9	61	18	35	32	63	44
<i>Operations Research Journals (12)</i>	147	1	1	4	5	8	3	12	18	10	56	29
<i>Discipline based Journals</i>	83	1	0	3	0	8	7	15	10	20	8	11
<i>Marketing (1)</i>	75	1	0	2	0	5	7	15	9	20	6	10
<i>Sociology (5)</i>	6	0	0	1	0	3	0	0	1	0	0	1
<i>Economics (2)</i>	2	0	0	0	0	0	0	0	0	0	2	0
<i>Substantive Discipline Journals</i>	252	4	4	11	12	15	22	29	47	42	35	31
<i>Information studies (11)</i>	97	0	2	2	1	4	2	13	18	28	15	12
<i>Technology studies (7)</i>	35	3	1	0	1	2	8	1	9	2	3	5
<i>Service studies (3)</i>	8	0	0	0	0	0	1	3	2	0	1	1
<i>Sector studies (17)</i>	96	0	0	7	10	9	10	11	16	9	12	12
<i>International studies (6)</i>	6	0	0	1	0	0	1	1	0	1	1	1
<i>Business Management studies (9)</i>	10	1	1	1	0	0	0	0	2	2	3	0
<i>Subtotal Citations from Journals</i>	1,287	7	28	34	53	78	125	106	158	193	290	215
<i>Books</i>	156	0	1	3	3	5	13	9	19	48	11	44
<i>Conference Proceedings</i>	171	1	1	8	17	22	31	37	18	9	11	16
<i>Others / Magazines</i>	210	1	1	2	1	4	12	14	32	27	49	67
<i>Subtotal Citations from Other Sources</i>	537	2	3	13	21	31	56	60	69	84	71	127
<i>Total Count of Citations</i>	1,824	9	31	47	74	109	181	166	227	277	361	342
<i>No. of Logistics Outsourcing Articles</i>	119	6	4	4	10	10	13	8	20	18	18	8

Table D.6: Logistics Outsourcing Citations from 2003-2013

Citation Source of Logistics Outsourcing Journals	Count of total citations	Rank of total citations	% of total citations	Citations per Article
Logistics and Supply Chain Journals (9)	478		26.21	4.02
<i>Int Journal of Logistics Management</i>	63	8	3.45	0.53
<i>Int Journal of Logistics: Research & Applications</i>	58	9	3.18	0.49
<i>Int Journal of Physical Distribution & Logistics Mgmt</i>	166	2	9.10	1.39
<i>Journal of Business Logistics</i>	66	7	3.62	0.55
<i>Journal of Purchasing and Supply Management</i>	14		0.77	0.12
<i>Journal of Supply Chain Management</i>	53	10	2.91	0.45
<i>Supply Chain Management: An International Journal</i>	36		1.97	0.30
<i>Transportation Research Part C</i>	4		0.22	0.03
<i>Transportation Research Part E</i>	18		0.99	0.15
General Management Journals	43		2.36	0.36
<i>British Journal of Management</i>	1		0.05	0.01
<i>Business Horizons</i>	3		0.16	0.03
<i>Journal of Business Research</i>	3		0.16	0.03
<i>Long Range Planning</i>	1		0.05	0.01
<i>Management Decisions</i>	8		0.44	0.07
<i>Omega</i>	27		1.48	0.23
Operations Management Journals	284		15.57	2.39
<i>Int Journal of Operations & Production Management</i>	36		1.97	0.30
<i>International Journal of Production Economics</i>	202	1	11.07	1.70
<i>Journal of Operations Management</i>	11		0.60	0.09
<i>Production and Operations Management</i>	4		0.22	0.03
<i>Production Planning & Control</i>	31		1.70	0.26
Operations Research Journals	147		8.06	1.24
<i>Annals of Operations Research</i>	1		0.05	0.01
<i>Decision Sciences</i>	7		0.38	0.06
<i>European Journal of Operational Research</i>	25		1.37	0.21
<i>Group Decision and Negotiation</i>	2		0.11	0.02
<i>IEEE Transactions on Engineering Management</i>	3		0.16	0.03
<i>Interfaces</i>	3		0.16	0.03
<i>International Journal of Production Research</i>	88	5	4.82	0.74
<i>Journal of the Operational Research Society</i>	11		0.60	0.09
<i>Operations Research</i>	1		0.05	0.01
<i>OR Spectrum</i>	2		0.05	0.01
<i>Systems Research and Behavioral Science</i>	3		0.11	0.02
Subtotal Management Journals	952		52.19	8.00
<i>Marketing (9 Journals)</i>	75	6	4.11	0.63
<i>Sociology (4 Journals)</i>	6		0.33	0.05
<i>Economics (2 Journals)</i>	2		0.11	0.02
Subtotal Discipline Journals	83		4.55	0.70
Information Studies (11 Journals)	97	3	5.32	0.82
Technology Studies (7 Journal)	35		1.92	0.29
Service Studies (3 journals)	8		0.44	0.07
Sector Studies (17 journals)	96	4	5.26	0.81
International Studies (6 Journals)	6		0.33	0.05
Business Management Studies (9 journals)	10		0.55	0.08
Subtotal substantive disciplines	252		13.82	2.12
Subtotal Top Journals	1,287		70.56	10.82
Books	156		8.55	1.31
Conference Proceedings	171		9.38	1.44
Others / Magazines	210		11.51	1.76
Subtotal Other Sources	537		29.44	4.51
Total Citations	1,824		100.00	15.33

Table D.7: Citation Sources for Logistics Outsourcing Articles from 2003-2013

APPENDIX E

ABSTRACT OF CODING SCHEME PROCESS

Theoretical constructs that were informed by the initial conceptual framework:

Construct	Items
<i>Strategic Capabilities (RBV)</i>	Physical Assets Relational Capabilities Organisational Capabilities Knowledge and Know-How
<i>Governance Mechanisms (TCE)</i>	Opportunistic Behaviour Uncertainty and Frequency of Transactions Transaction Asset Specificity Small Numbers Bargaining Transaction and Contracting Costs Negotiation Costs (<i>ex-ante</i>) Monitoring Costs (<i>ex-post</i>) Switching Costs
<i>Outsourcing Arrangement (AT)</i>	Opportunistic Behaviour Goal Incongruences Information Asymmetry Moral Hazard and Adverse Selection
<i>Systems Integration Capabilities (SI)</i>	Products, Service and Systems Adaptation to Market Changes Customer and Consumer Interaction

Table E.1: Coding Guide based on Theoretical Constructs

Construct	No.	Archetype	Interviewees' Responses
Strategic Capabilities (RBV)			
<i>Physical Assets</i>	10	LSC	We have a relatively modern vehicle fleet [...] because shippers are more and more [environmentally] cautious about that.
	6	LSP (out)	We mainly have own facilities within Europe. However, in other countries, such as Scandinavia and a little bit in Eastern Europe we work closely together with partners.
	5	LSP (inst)	We aim to develop distribution networks [in all European countries] where [our customer's] stores act as dedicated depots. [...] therefore we can guarantee same day delivery
	9	LSI	We have around 150 own vehicles [...] because we need extra-large trailers for the fashion industry.
<i>Relational Capabilities</i>	11	LSC	We usually have an agreement, but even with corporate enterprises, the relationship is based on verbal agreements. [...] because our operations are only a small part of the bigger picture, [for example] when [our customer] builds a power plant.
	7	LSP (out)	We mostly have one essential contact person for [for each of our] customers, who we sit and get together with in order to evaluate... what factories do you have, and what issues [and problems] do we need to solve?
	4	LSP (inst)	We collaborated into a joint venture with our customer, and since then we exclusively offer our logistics services to them.
	14	LSI	Projects differ based on the customer's requirements [...] that is separate from the daily business operations. [...] and we adjust for example, operations related to the handling of documents [...]. We then collect all the documents [...] and collectively transfer them at the end of the project, for a certain management fee.
<i>Organisational Capabilities</i>	11	LSC	We collaborate between our business units to a certain extent. For example if there is a project where we need transportation and organisation of heavy cargo [...] we transfer the operations within our offices [and business units]
	12	LSP (out)	Our organization grew and developed over time [...] in terms of revenue and number of shipments. The number of partners is constant and we work with around 45 partners within Germany.
	5	LSP (inst)	We use our office in Asia for issues regarding import taxes and tolls because we are not licensed for these exports from China. [...] once the shipment is on the vessel we switch ownership to our organisations and we can further command the shipments.
	13	LSI	Our different departments are all separate business units [...] that communicate and collaborate with each other.
<i>Knowledge and Know-How</i>	11	LSC	Because the material is very sensitive [...] they do not subcontract [the transportation] to a random carrier. They know that we are aware of the material specifications, and we have years of experience in loading and handling that material.
	7	LSP (out)	At one of our [European] facilities, we train drivers for two weeks in a row and we show them how to drive on a specialized truck. We are planning to expand that project to other [European] branches that we own. [...] Every service employee in each branch is trained equally [...]
	15	LSP (inst)	We pay our drivers more money [...] and they also get additional employee training modules [...] considering security and loading processes.
	14	LSI	We developed a lot of know how in integrating and [coordinating] different systems into one system [...] and it requires a lot of know how that these systems run without errors or problems.

Governance Mechanisms (TCE)			
<i>Asset Specificity</i>	3	LSC	We deliver the same components for our customers. The parameter for [these components] is always the same to a certain extent... sometimes they are [...] longer, or [...] heavier, depending on the capacity of a construction site... but such a component is never five meters wider. We talk here about a range between one and two meters [...]
	12	LSP (out)	Compared to other providers that only accept standardized and palletized cargo, we are slightly different. [We] transport a lot of cargo that is round, overlong, heavy and bulky cargo, such as, for example, [...] packed furniture for backyards, especially now in the summer months. [...] [...] But this cargo does not fit [...] on a standardized EURO pallet.
	4	LSP (inst)	The products we transport are extremely dangerous [...] and require special treatment. [...] If we wanted to transport any other material [...], it would cost too much [because] the equipment is dedicated to specific products [...] cleaning our containers goes into [thousands]
	14	LSI	You can imagine, whenever we develop something new [...] and customised to their specific requirements, this is associated with high costs.
<i>Uncertainty and Frequency</i>	11	LSC	In case of the conventional transports, [...] we have some customers where we know that the requirements are the same every day, and they do not change. [...] However, the components are delivered to different locations, due to the different locations of construction sites, such as a construction site in Fulda, or in Berlin, or in Frankfurt for example. [...] But the main parameters remain the same for our customers.
	7	LSP (out)	If for example a machine shuts down [...] the customer integrates us more in order to guarantee the continuous delivery of spare parts or goods. Because we need to deliver quickly. [...] It is not easy because we cannot plan precisely [...] I do not know what exactly to expect and what not. [...] when we realize the vehicle is not fully utilized [...] we use the truck for something else, which means the planning changes.
	4	LSP (inst)	Mostly we operate on a contractual basis [...] however, there are uncertain operations for example in case of an emergency, when we have to supply our customer's plants immediately.
	14	LSI	[All our operations] are pretty predictable, because we usually have the same products, such as textiles, or in the DIY industry [...] everything that you can use in the garden for example.
<i>Monitoring and Switching</i>	11	LSC	It is very difficult to measure customer satisfaction. [...] we do that very roughly [...] only when we actually visit the customers once a year [...] where we discuss about what went well and what went wrong.
	6	LSP (out)	We provide quality measurement that represents a clear evaluation of our provided services. Consequently, this measures our quality. Our processes are monitored on a daily basis, so we have security and can guarantee that quality is high within the entire network every day.
	5	LSP (inst)	We negotiate prices for the whole year, because we want to secure a stable price and not be affected by fluctuations.
	9	LSI	It is very difficult to estimate the switching costs, but acquiring a new customer would cost between three and seven thousand Euros.
<i>Small Numbers Bargaining</i>	11	LSC	The market situation at the moment is that there is a large number of firms in Germany. [...] And many small logistics firm specialise and focus on a certain industry as well.
	6	LSP (out)	In the past, customers tend to use the cheapest carrier on the market in order to achieve a cost surplus due to cheaper market prices.
	5	LSP (inst)	We are certainly in a position where we command our service providers' capabilities by saying we have 2,000 TEUs per year [...].
	9	LSI	Supplier bargaining power depends on the market conditions. [...] for example transportation to Turkey is very easy to switch suppliers and find a different carrier [...]

Outsourcing Arrangements (AT)			
<i>Goal Incongruences</i>	3	LSC	Due to common goals, [...] we can rely on our partners' collaboration. [...] [However,] [The manufacturers] damage their own logistics structure by spreading the transportation and delivery services across multiple carriers. And they do not follow the same goals. The supply chain from the raw material, to the finished goods, to the local stores is disrupted by several firms, which leads to many losses [in performance]
	23	LSP (out)	After implementing the IT system [for example] the testing phase starts, which means suffering for four weeks, on both sides. Both parties see it as an investment in the future and in improving processes in the future.
	5	LSP (inst)	We work closely together with a distributor that is in charge of invoicing and importing [all our products] and it is in both of our interest, to [understand] the complex liability regulations and so on.
	9	LSI	We deliver our customers' retail stores and online stores. [...] However, our aim is to overcome the retailer's dilemma of cannibalisation of their products from the high street stores.
<i>Information Asymmetry</i>	3	LSC	There is none or only little exchange of information between partners [...], which is a big problem. However, this will change in the future, because it is not possible to continue our operations the way we used to do them.
	12	LSP (out)	We know exactly what will be in Stuttgart, Munich or somewhere else at the next day if a partner sends a vehicle with deliveries for half of Germany. The individual partners highly interact with each other. However, in today's world, similar to many other industries, this process is highly digitalized. That means rarely based on enquiries or telephone calls, but mainly via transmitting data through the intranet, or an internally organized platform.
	5	LSP (inst)	Our subcarriers [in each country] get an update once a week on what days; we expect shipments to arrive, including the dedicated delivery times.
	14	LSI	Our integrated IT systems illustrates all scanning events [...] and [the customers] can access any status updates in real time [...] nothing is manual, everything is automated.
<i>Moral Hazard / Adverse Selection</i>	10	LSC	We react very flexible to customer demands. [...] and we act in our customers' best interest. For example, two years ago, one customer required special trucks for an internal transport between production plants [...] and within two days, we organised ten of these special vehicles.
	23	LSP (out)	For one customer [for example] we offer storing and parcel distribution, and palletized cargo. [...] and he is in urgent need for additional warehouse space [...] then we will offer him space in a different warehouse for the same rates. Even though I know that, it is just temporary and we will not get the new business [...] but on the other hand, if we would not accept the additional pallets to the same rates, we might lose the customer.
	15	LSP (inst)	A major issue why the bids for our customer's transportation services did not return satisfactory offers was that our manager could not make it understandable for logistics firms. [...] even though these are very basic calculations and specifications, but if no one communicates them properly... [...] the know-how of translating logistics language into industry language was missing
	9	LSI	Our customers know that we can offer them all solutions along the supply chain. They can, if they wanted to, source separate operations [or activities] from different suppliers

Systems Integration Capabilities (SI)			
<i>Products, Service and Systems</i>	10	LSC	For certain customers we only provide the pure transportation services [...] for others we also conduct warehousing and the final distribution within Germany.
	6	LSP (out)	We offer different transportation and delivery services considering various lead times, from which the customers can choose [...] which include pick up, transshipment, and eventually delivery to the final customer.
	5	LSP (inst)	I alone developed 15 different logistics models in order to select the best option for our customer's needs and requirements. [...] Our main difficulties are being as cheap as possible and fulfilling all the legislation requirements.
	9	LSI	We redesign our services completely new towards 4PL services, and that is how we sell it to our customers.
<i>Market Adaptation</i>	11	LSC	We are very flexible, because we have three spare vehicles in our region. And because we have our own vehicle fleet, we can re-arrange deliveries quite easily.
	12	LSP (out)	We are very flexible, because we command the medium sized firms, which is per se always more flexible. [We] are very close at the regional [customers] where services are required. Of course [we] have access to much quicker and more agile units and can react more to market changes [...] this is comparable to retail business, and you have probably experienced this by yourself, it makes a difference if the owner of a shop conducts business with you [as a customer] and knows what he is talking about.
	15	LSP (inst)	We do not have many direct competitors [...] because it is a very specialised and small niche market. [...] And we offer everything for our customer from A to Z.
	14	LSI	We also offer value added services, such as in the textile industry, for example, we control the quality.
<i>Customer Interaction</i>	3	LSC	We used to handle one hundred per cent of our customer's procurement volume [...] Today we have the situation that our customers rethink their operations and therefore [...] multiple carriers deliver the [inbound] shipments.
	6	LSP (out)	We do not have any private customers. Hence, the final customer so to say is the retail store, or gastronomy. Or the smallest unit is the retailer on the high street. Anyone else is not included in our portfolio.
	15	LSP (inst)	We supervise our customer's operations in terms of [...] transportation planning [...] and we are completely integrated into our customer's functional areas. [For example] our logistics planner is employee for our customer at the same time. [...] and we sometimes control our customer's orders and internal operations [and] specify performance conditions.
	13	LSI	We have customers in most industries, [such as] fashion retail, [...] automotive, [...] insurance and banking customers, [...] and pharmaceuticals.

Table E.2: Abstract of Coding Scheme Process